Timing the Muse: Creating the musical experience, expressively directed micro-timing and the pianist's signature voice

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ABSTRACT

Timing the Muse: Creating the musical experience, expressively directed micro-timing and the pianist's signature voice

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Highly accomplished performing artists are distinguished by the precision and fluidity of their performances. The greatest have the ability to deliver expressively directed signature performances that differentiate their work from all others in the domain. The results are creatively varied experiences that can be deeply moving. The present thesis explores, by means of spectrographic analyses and comparisons of performances both between and within individuals, the way such unique performances reflect the artist's ability to expressively direct the micro-timings of their playing, revealing both signature constancy and creative variability across a succession of performances.

The research hypotheses addressed in this thesis are (1) that expressively directed variability in micro-timing can be revealed through amplitude time-line and spectrographic analyses of an artist pianist's performances; (2) that highly accomplished artists will be found to be consistent in their use of micro-timing across performances spanning lengthy periods of time; and (3) that individual artists will be distinct in their use of micro-timing compared to the performances of other artist pianists. These hypotheses are examined through comparative performance analyses of recordings by great pianists, including comparisons of a single work performed by a number of artists,

analyses of Vladimir Horowitz performing several pieces over many decades, and analyses of performances of the same piece by Horowitz and the other great pianists.

The results revealed that there are expressively directed micro-timing features in Horowitz's piano performances that can be distinguished from those of other artists, features that can be identified in spectrographic analyses of the recordings. The existence of such signature micro-timing raises a number of interesting questions, such as what is the source of a clearly defined personal artistic signature, and why does the signature remain identifiable given that a creative artist will rarely perform the same work exactly the same way on successive occasions. The thesis discusses these and related questions and as well it examines a framework aimed at addressing fundamental questions about aspects of high-level performance and the nature of a distinctive piano signature.

DEDICATION

TO PHIL COHEN

my mentor, coach and dearest friend.

Without his irreplaceable

counsel, dedication and knowledge

there would be no pages to fill

in this thesis.

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My appreciation to Pamela Korman, my duo piano partner for the great moments we shared at the same piano, at two pianos and with a third pianist squeezed between us in our concerts with instrumentalists and singers, a dancer and a reciting actor. Every performance aimed at a becoming a well-timed prelude for the thesis. The best made it.

I thank my daughter Melanie for her faith in my thesis project and her help when circumstances got in the way of my work. Melanie was always there whether it was a family or personal emergency or, for that matter, whether I needed her to birdie sit with Farinelli, my parrot.

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I'll conclude here with a toast to Farinelli, my beloved Conure parrot, for his cheerful wake up call every morning and for sharing my food, resting on my shoulder and gently nibbling at my ears while I tap away at the computer. But, alas!! I'm ashamed to admit that poor Farinelli is tone deaf, a failed musician even though he bears the name of a great castrato singer. The best he can reproduce is a sound of sorts that he greets me with when I enter his room. His feathers are beautifully coloured and he is a joy to live with. That's about it for Farinelli.

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PREFACE

Timing and the musical experience: a personal journey

Timing is a capricious partner for a musical performer. It can be both the key to creating a successful musical experience or a potentially embarrassing disaster. Whether a performer is aware of it or not, every time she appears in public she is silently calling on her muse to help her get her timing right. She soon finds that timing is an unpredictable, intrinsically variable experience. It is of no interest to the muse until the player turns the unpredictable into an experience that is intrinsically creative. This partnership of muse and musician is a lifelong journey. My personal journey is a case in point.

My interest in the timing experience grew out of my studies as a piano major at the State Music School in Bielsko-Biala, my hometown in southern Poland. Bielsko-Biala is a small provincial town but there were many opportunities to attend excellent musical and theatrical performances by visiting artists.

My earliest timing experiences were not confined to my music studies. Just getting to school on time was a problem. I exasperated my teachers by constantly showing up late. “Why”, I was asked, “does a ten minute walk take you an hour to get here? Is it because you don’t bother to check the time?”

In my performance classes I was cautioned never to confuse the relative freedom I have as a solo performer with the timing “constraints” that I must observe when playing with other musicians. The first constraint was to make sure I play in time with the ensemble. The second was to check the beat with my metronome.

The issues of freedom and constraints impressed upon me at music school turned into serious questions when I first heard Sviatoslav Richter play Tchaikovsky's b flat minor Piano Concerto (op. 23) with our local orchestra. It was an awakening for a teen-age piano student: a great pianist inspiring ordinary players to synchronize with his interpretation and achieve a level of excellence beyond anything I had ever heard them do before. In some magical way the entire ensemble timed itself to Richter's expressive vision of a virtuoso masterpiece. Richter chose Tchaikovsky's Seasons for solo piano as an encore. I listened in awe and asked myself whether this was the same Tchaikovsky "Seasons" I had recently performed at our school concert? Why did it sound so different? What did he see in the score that I failed to notice? Why was his timing so special? Was it a secret that only Richter knew?

Timing differences also intrigued me some years later when I heard Artur Rubenstein and Vladimir Horowitz play Chopin's Ballade No1 in g minor within a few weeks of each other. I was studying the Ballade at the time and was eager to hear it played by these two wonderful pianists. I brought the score with me to both concerts. What struck me was how different their performances of the Ballade were from anything I had ever imagined in my own or anyone else's playing. So different and yet so right sounding.

Gazing back and forth from the score to the stage wasn't much help either. Both sounded great yet each created a very different experience out of the score in front of me. I remember telling a friend about how impressed I was at the ingenuity of these two artists: how they could express something so personal without changing a note that Chopin had written.

As Artist-in-Residence in Concordia University's Leonardo Project, I have over the years timed my phrasings with the bowing of a violinist or a cellist, played standard and experimental works for solo piano, duo piano and every available accompaniment and chamber music ensemble. I have performed with and interviewed celebrated actors and directors, composed an experimental play for solo actor and pianist and received feedback from a playwright and a theatre teacher. And underneath it all was the matter of timing the experiences we created.

I have participated in discussions and presentations on performance issues in Dr. Segalowitz's Cognitive Psychology Lab and the on-stage explorations conducted by Prof. Cohen in his seminars, rehearsals and post performance analyses with instrumentalists, singers, dancers and actors. The issues we dealt with inevitably came down to questions about how a performer might best organize her resources to create a convincing musical experience. There were differences in perspectives but there was general agreement that the apparent stumbling blocks to understanding stemmed from the perception of something that felt right but was difficult to explain. Creating the experience was clearly as fascinating, and perplexing, to the scientific and musical communities as it has been to me as a performing musician. It has, as a consequence become the "raison d'être" for "Timing the Muse:" that is, how I might go about unraveling the mystery of a great pianist's unique timing of the aesthetic experience. And by inference, the possible contribution the findings might make towards our understanding of high level human performance at its fullest in disciplines other than music.

For some reason one timing question has still to be answered: Why is it that I still have trouble getting to school on time?

Timing the Muse: Creating the musical experience,

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CHAPTER 1

INTRODUCTION

The composer creates the music.
The performer creates the experience.
The listener interprets the experience.
Phil Cohen

Scene: Moscow Conservatory. A video recording of a piano recital. The pianist is Vladimir Horowitz. Applause greets Horowitz as he crosses the stage, bows and seats himself at the keyboard. He pauses, eases himself forward, and begins to play the Traumerie (Reverie: Dream) from Robert Schumann's Scenes from Childhood. Horowitz immediately establishes a mood of shared intimacy with his listeners. The tempo is un-hurried, the melodic lines overlap, blend, contrast and answer each other as if in a hushed conversation. The sense of shared intimacy continues without interruption from the opening note to the final cadence. The tones drift off into silence. Time stands still. A burst of applause. The spell ends.

The camera captures the mood of the scene by scanning back and forth from Horowitz's hands and face to close up responses from the audience. Most revealing are a listener's eyes: eyes filled with tears; eyes restraining tears; unabashed tears streaming

down the cheeks. For some it was an unspoken and deeply personal event. For all it was a memorable experience. Total playing time 2:23.

Robert Schumann created the music. Vladimir Horowitz created the experience. The listeners interpreted the experience.

The emotive power of the experience Horowitz created with Schumann's Träumerei brings up tantalizing questions about the art of a great pianist. Was the experience an inspired one-time event? Could Horowitz repeat it with a different audience in a different environment? Could he create equally memorable musical experiences no matter what pieces he played or how differently he played them? If so, would these experiences share characteristics that identified the pianist as Vladimir Horowitz? And by implication, could the same be inferred for other highly accomplished pianists?

Micro-timing the creative experience

The hypotheses underlying this thesis are that there exists micro-timing patterning and consistency in the performances of artist pianists that can be objectively detected and quantified by means of appropriate measures. Moreover, these patterns underlie the particular aspects of performance identified above, including the performer's unique aesthetic signature. Thus, this thesis explores the extent to which one can systematically address the highly accomplished pianist's expressively directed micro-timing of the musical experience.

Expressively directed micro-timing in the present context refers to the nuanced durations employed by a highly accomplished pianist to creatively vary the notated

details of the score into a distinctive musical experience. These include the tempo, dynamics, articulations and pauses; the synchronization of the melodic lines and harmonies and the less evident qualities of tone that mark the ebb and flow of a musical performance. In effect, expressively directed micro-timing enters into virtually every aspect of a masterful performance from its minutely varied details to its overall duration.

The concept of expressively directed micro-timing has provided the thesis with a perspective that is consistent with the working references below: namely that the complexities involved in distinguishing the signature voice of a master pianist demand an analytical process that compares individual differences between the best and the best.

Micro-timing the pianist's signature voice: creating an expressively directed musical experience.

The analytical process is accordingly conducted as a comparative performance study of the signature voice that distinguishes a supremely accomplished concert pianist from all others in the domain. As such, expressively directed micro-timing can be said to integrate a player's musical skills with his or her aesthetic choices and creative invention. It optimizes skill and creative spontaneity by bringing a measure of order to these internal relationships. For an artist performer the measure of these conditions is how well they translate into subjective experiences that cannot be expressed through words alone. Expressively directed micro-timing can from this perspective, be considered a central factor in the communication of an aesthetically conceived musical experience.

The comparative performance analyses concentrate in particular on Vladimir Horowitz's recordings over time and circumstance. The comparisons include the following:

- analyses of a single work performed by different artists (Chapter 3)
- analyses of a single artist (Horowitz) performing several pieces over many decades (Chapter 5)
- analyses of performances of the same piece by Horowitz and the other pianists (Chapter 5).

The aim is to guide the reader through each stage of the analytical process in order to clarify the role that expressively directed micro-timing plays in identifying a great pianist's performing signature. It does so by a) identifying the player's consistent and creatively varied signature features as they occur in repeated performances of compositions selected from across the repertoire. These features are comparatively analyzed with performances by other major pianists. The issues that arise in comparing these distinctions are considered in detailed micro-timed analyses of Horowitz's unique voice-leading relationships in a variety of contexts and modes of expressively directed creativity (Chapters 4, 5).

Underlying this study are three working reference points**.** The first is the *bio-aesthetic hypothesis* proposed and developed by Phil Cohen (2008). Cohen postulated an embodied conductor delegated to synchronize and *expressively direct* a pianist's biological, aesthetic and cognitive resources. He coined the term *expressively directed timing* to distinguish the *timing of a specific performer* from *expressive timing,* the more general term employed in previous studies.

The bio-aesthetic hypothesis is especially interesting because it provides a way of viewing how a performing artist mobilizes her internal resources to bring about an expressively directed musical experience. At the same time it suggests a regimen aimed at establishing a comprehensive, individually focused approach towards achieving creative variability in successive performances of the same work (Cohen, 1996, 2008) The process includes a cross-sensory synchronization of relationships between relevant aspects of melody, harmony, rhythm and timbre as they unfold in practice sessions, rehearsals and performance (Cohen, 1996).

The second working reference point is the conception of the piano as an orchestra and the pianist as its conductor: in the present context the pianist's *embodied conductor.* The concept is derived from Franz Liszt's observation that the seven-octave range (presently seven and a third octaves) of the modern piano is the only instrument that equals that of a full orchestra. The shared octave range, as well as the parallels between their dynamic levels, speed and subtlety of tonal response, give the pianist expressive opportunities normally reserved for the entire body of orchestral instruments (Mach, 1980). In this regard, Ferruccio Busoni notes that piano transcriptions of entire symphonies, chorale works and excerpts from operas served as *performing references* for study and public concerts in the 19th century (Busoni, 1965). This idea of the embodied conductor expressively directing micro-timed distinctions in a variety of musical contexts is developed throughout the thesis.

The third working reference point can be referred to as the *cognitive science perspective* on skilled performance. Studies drawn from the psychological literature on musical and human performance have provided scientifically oriented insights into the

premises, development and conclusions of the thesis. In recent years a growing number of studies have dealt with relevant issues in performance variability, creativity and timing. These studies draw on basic concepts in cognitive psychology and the neurosciences concerned with skilled performance. Studies in this category are alluded throughout the thesis where appropriate.

In addition to the three working reference points described above, there are two main sources of *supporting references* that inform this study. The first is the body of studies drawn from the musicological literature on historical and contemporary performance practices (Chapters 4 and 6). The second is the body of published and recorded interviews with historically acclaimed pianists, composer/pianists and teachers (Chapters 4, 5 and 6). Together they provide valuable insights into the nature of performance creativity and its cultivation in one's search for an individual voice.

Performances that are regarded as creatively varied experiences bring up questions about interpretation, improvisation, creative variability, arrangement and recorded editing: namely what are their roles, if any, in communicating these experiences. The on stage distinctions between these terminologies are important considerations in a research context that seeks evidence for a pianist's individual voice in his or her employment of expressively directed micro-timing (Chapter 4).

These distinctions are considered in the discussions that follow. The aim is to guide the reader to their applications as they are considered in the present study.

Interpretation*:* An interpretation in classical music is generally understood as a prepared version of the original score. It may include modifications in the timing of phrase relationships, tempo, pedaling, ornamentation, voicing and overall emphasis. In

the present study it refers, unless otherwise indicated, to the listener's response to the musical experience.

***Improvisation**:* Improvisation in classical music refers to two modes of creatively directed performance. The first is a spontaneous embellishment of the melody, harmony, and tempo of a composed work in whole or in part. The second is a spontaneous onstage composition on a given theme by a listener. Jazz performance is a contemporary example of the second mode of improvisation. An accomplished jazz performer is free to spontaneously alter every recognizable detail of the opening theme in every improvised sequence that follows. Improvisations prior to the twentieth century were occasionally prepared formula additions to the score designed to show off the virtuosity of an otherwise undistinguished pianist (Hamilton, 2008).

The concept of creative variability is considered as a third mode of improvisation. It differs from traditional improvisation because it restricts the pianist to maintaining the recognizable details of the existing score as written in repeated performances. These restrictions confine creatively varied performances to highly accomplished pianists who are equipped to shape outstanding musical experiences out of the expressive resources provided by the piano as an orchestra (Chapters 3, 4, 5 and 6).

Whatever their individual differences may be these contrasting modes of improvisation provide a master jazz, classical or experimental player with a means for expressing his or her creative individuality to the fullest.

Editing. Editing in the present context refers to alterations in a recorded performance. Most common is the correction of errors. Editing can also involve the restructuring of the entire recorded work into a new musical experience. Familiar

examples of the latter can be heard in Glenn Gould's masterful reconstructions of his recorded performances (Guertin, 2007). Less familiar are the efforts of recording engineers who intuitively act upon expressive judgments that coincide with those of the performer (Rosen, 2002).

Arrangement. A piano arrangement is a re-composition of a work that was originally written for another instrument, voice or ensemble. Piano arrangements of chamber music and symphonies were the norm for study by composition students as well as performers in the 19th century. Ferruccio Busoni's piano arrangement of J. S. Bach's Chaconne for solo Violin is a classic example as are Franz Liszt 's arrangements of Beethoven's symphonies and excerpts from Richard Wagner's operas.

Terminologies and performance practices

Terms such as improvisation, interpretation arrangement and editing in the classical piano repertoire are often assumed to describe modes of performance practice that have remained unchanged from the invention of the piano in the 18th century to the present day. The piano, as it turned out underwent major changes over the years, as did the cultural climate and the prevailing performance practices. The latter drew on these changes to create musical experiences that brought different meanings to the above terminologies (Chapter 4). Take improvisation as an example. The term improvisation throughout the 19th century was applied to performance practices that are no longer considered in public concerts. These practices included an improvised prelude to the concert program, embellishments of the score, a spontaneous composition on a theme

suggested by a member of the audience and improvisation duels between the best and the best (Chapter 4).

These performance practices summarize the difference between classical improvisation as it is understood today and how it was practiced in the years past. As noted above the lack of opportunities to improvise in a variety of on stage contexts prompted the decision to replace generally understood improvisations with the term creative variability. Creative variability is therefore intended to maintain the practice of identifying spontaneity with the outstanding musical experiences created by a highly accomplished pianist from all others in the field (Chapters 3, 4, 5 and 6).

The Score. *The score contains the truth, and nothing but the truth, but not the whole truth.* James Webster (cited in Taruskin, 1995 p.185). A notated music composition exists as a document fixed in space and time. It can be studied, expanded upon, reduced, revised or otherwise interpreted; yet it will remain as a document until it is performed. Once heard, it unfolds from the page into a living experience. The moment the music ends the experience will continue to exist solely in the subjectively interpreted memories of its players and listeners. Every subsequent performance will be subject to a re-interpretation.

Score editions: Contradictions in the search for the truth. The contradictions between editions of keyboard works from the 18th and 19th century repertoires can be a hornet's nest for the researcher as well as the pianist. This is partly due to pendulum swings between interpreted versions of historical performance practices and the need to make the music intelligible in contemporary terms. From Bach and Scarlatti to Mozart,

Chopin and Liszt, the contradictions often reveal as much about the editor's stylistic preferences as they do about the performance of the music (Chapters 2 and 4).

The above introduction to the tools, working references and terminologies employed in this thesis brings up the question about the means by which the comparative analyses are represented and measured in acceptable scientific as well as musical terms. These means are discussed in the three following contexts.

Computer based analyses: Visual Representation and Measurement

Comparative performance analyses can be represented visually by computer based amplitude timeline and spectrographic analyses (Chapter 2). Questions that arise on the limitations of computer-based analyses are reviewed in Chapters 4 and 5. All comparatively analyzed performances are measured and identified numerically in tables that show their overall and millisecond durations. Performances analyzed and visually represented for data base reference are discussed in Chapter 6.

Aural analyses: The elusive qualities of the signature voice

The study accounts for the elusive qualities of a highly accomplished pianist's signature voice by means of aural analyses of the subjective connections that a pianist creates between subtly varied degrees of touch, tone and harmonic resonance. These include specific qualities of tone as well as amplitude and harmonic resonances in a variety of contexts. A pianist's singing tone, for example can be considered a voice that sings through sounds without words. Detailed aural analyzes can show why the

subjective content of an unspoken song cannot be entirely measured but can be identified and explained (Chapters.2, 4, 5 and 6).

Psychological studies: Expressivity, timing, creative variability and research boundaries—a preliminary discussion.

A growing number of cognitively focused studies in recent years have been conducted on expressivity and its influence on timing in musical performance. These and related studies have provided valuable insights into the complexities associated with defining the creative process, its given variability, expressive timing and their individual distinctions. Here we will confine ourselves to an introductory discussion of selected research efforts that deal directly with the above issues.

To begin with, a considerable number of psychological studies have focused on listeners responses to variability in tempo as well as temporal changes in internal durations. Desain and Honing (1994), for example, show how the timing of a *grace note* is heard differently when it is repeated in a change of key. Unless the tempo is modified the performance is interpreted by the listener as expressively bland. In a subsequent study Honing (2004), questions the prevailing assumption that subtle changes in tempo such as *rubato* can be effectively explained in terms of the *physical laws of motion (kinematics)*. His study concludes that a *perception based (cognitive) model* of tempo modifications provides a more realistic perspective on how variations in timing will be musically experienced. Honing's perception based model of tempo modifications brings up the issue of whether an accomplished pianist's timing in a repeated performance is creatively varied or a random deviation from the initial beat. Chaffin, Lemieux and Chen (2006),

deal with this question in a study drawn from a quote by the distinguished Russian pianist Emil Gilels. When asked how he goes about playing the same piece at different times and places, Gilels replied: *It is different each time I play…sometimes I play with greater changes in dynamics, sometimes with less….it includes mastery of the work…before adding the fantasy (*Mach, 1991, Section 2, p.123).

Chaffin and his colleagues recruited a skilled pianist to test Gilel's reflections in seven performances of a rapid keyboard work by J. S. Bach. The researchers used the term *musical gestures* to identify the pianist's *crescendos, ritardandos, and micro-pauses between phrases.* Each performance took place in a different location. Their findings were instructive. Timings differed slightly when the pianist varied the dynamics of a phrase. They were markedly slower when she was confronted with technical difficulties. There was little to suggest that the performances were random. The study concluded that Gilel's reflections were indeed correct.

A comprehensive study of high level creativity conducted by Simonton (1999b) is particularly relevant in the present context. Simonton proposed an emergenic – epigenetic model of the creative process as it is cultivated and actualized by a highly accomplished individual independent of the discipline. His theory integrates the individual's inherited disposition (epigenetic) with its realization over a lengthy course of practice and revision (emergenic).

In a subsequent study (2004) Simonton proposes a *stochastic* model that considers the gamble that an *exceptionally creative* person takes when her achievements lead her to a road less traveled. He does so by bringing a fresh light to the likelihood that chance and

risk will be magnified in the lives of those whose creative aspirations challenge the limits of common acceptance.

Research efforts into high level human performance, its creative resources and means of communication have undoubtedly brought new insights into the many sided nature of the creative process. A search, however, for studies that aim at establishing a viable means for distinguishing the performing signatures of highly accomplished pianists has to date been unsuccessful. Individual differences are acknowledged, but their distinctive properties have yet to be comparatively analyzed over time and circumstance. This is curious when one considers that the communication of one's personal voice is the main concern of virtually every professional soloist on every instrument. Murray Perahia recalls how he resolved periods of doubt and confusion once he realized that he was communicating his musical voice as he heard it internally (Mach, Section 2 p.213, 1991). It is instructive to note here that the Chaffin study does not consider the signature implications of Gilel's concluding remarks: namely that one *must be caught in the spirit ....but at the same time ...remain true to the composer and independent as an artist.*

Eccentric timing and individual differences

The lack of further study into the makings of a pianist's signature voice has remained so even when the researcher has speculated on a possible connection between creativity and the striking individuality of a major pianist's expressive timing. Repp, for example, makes the point that the *eccentric* timing patterns of Alfred Cortot, Martha Argerich and Vladimir Horowitz may offer clues to their artistic superiority (Repp, 1992).

Eccentric timings may be of secondary interest in the majority of research agendas because they are perceived to be distanced from the expressive boundaries set by common practice (Iyer, 2002; Sawyer, 1998). These boundaries are well-established norms in the education of professional musicians (Repp, 1992). They allow for familiar turns of phrase to be varied but for the most part remain limited by commonly accepted taste. These limits have endured over the years because the majority of performers, scholars, critics and listeners are believed to experience them as aesthetically satisfying (Repp, 1992). Creative achievements, according to Csikszentmihalyi (1998), are validated when they are accepted by knowledgeable members of the field as worthwhile endeavours. This assumption is not entirely correct; musicologists routinely argue about what is meant by expressive correctness in performance practice (Taruskin, 1995).

The lack of studies devoted to the pianist's signature voice may also be due to the absence of a comprehensive methodology that focuses on precisely measured timings that are consistently specific to the player and to no one else. In this regard Benadon (2009) notes the efforts of Jazz scholars to bring measurable distinctions to the subtleties involved in the syncopated pushing and pulling of the melodic lines over a fluctuating underlying beat. These include micro-timing as well as terms such as *algorithmic modeling* (Johnson-Laird, 2002), metric *displacement* (Downs, 2001) and *Time Warps* (Benadon, 2009)

Here we will step back from our discussion of cognitive perspectives on creativity in musical performance to a much earlier study that dealt with problems in the repetition of pedalings that have been magnified by recordings, contemporary instruments and environmental acoustics (Chapters 4 and 5).

The pedaling conundrum

An early experiment (1929-1930) conducted by Carl Henlein is symptomatic of the complexities faced by researchers involved in a study that deals with relationships between timing and individual differences in a performing art. Henlein compared pedalings by highly accomplished pianists in Robert Schumann's Träumerei under a number of experimental conditions. These included the following contexts: playing from the open score; playing the work by memory; playing it repeatedly; imagining it unfold without playing the notes. Not one of the pianists could repeat his or her pedal actions in any of the contexts and all differed from each other (cited in Gabrielson, 1999).

In his summary of Henlein's experiments, Gabrielson concluded that the results confirm that pedaling is firmly integrated with other timing factors in the organization of a pianist's repeated performances. The slightest change of intention will alter the action (Gabrielson, 1999). Gabrielson's conclusion echoed those of Ravel and Debussy who, among other major composers rarely notated pedaling in their scores because it was impossible to know how they will be interpreted (Korman, 1996).

It is also difficult to know exactly how accurately pedaling will be represented in a spectrographic analyses of a recording (Chapters 3, 4 and 5). As a consequence, a major concern of the study lies in the set of complex issues faced by a researcher attempting to determine the nature of pedalings in recorded performances of the same work by different pianists on different pianos in different environments. The good news is that spectrographic representations will occasionally show how a highly accomplished pianist can turns these enigmas into a seemingly impossible musical experience. These can be seen in Chapter 5.

Concluding Remarks

The argument developed in the following chapters asserts that supremely accomplished concert pianists are distinguished by their ability to transcend interpretative norms in their performances of a notated work. Like Beethoven, Chopin, Liszt, Godowsky and other pianist/composers of the 19th and early 20th centuries, they imagine possibilities beyond the apparent capabilities of the instrument at their disposal (Rimm, 2008). No two performances of the same work will be heard as alike, yet each will bear the artist's expressively directed musical signature. From this perspective the inspired performances of a great pianist can be considered works of art in there own right (Cohen, 2008).

The study develops the argument by means of comparative analyzes between performances of celebrated pianists. The analyses show how expressively directed micro-timing enters into virtually every aspect of a highly accomplished pianist's performances. These include the pianist's articulations, nuances, inflections, pulse rhythms and dynamic patterning as well as the less evident qualities of tone that mark the ebb and flow of musical communication.

The argument considers the fact that the contemporary piano is the only instrument equipped to express musical possibilities similar to those of an orchestra. Like the orchestra it can blend and contrast four or more voice parts, harmonies, rhythms, articulations, dynamic levels and structural relationships over a range of seven and a third octaves.

The parallels drawn between the piano and orchestra suggest the presence of an embodied pianist/conductor. The conductor brings creatively varied perspectives to the pianist's signature voice in successive performances without adding to, subtracting from or otherwise embellishing the notated score. When micro-timing is cognitively organized and aesthetically directed it can be understood as a response to the conductor's baton.

An art, by definition, brings a vision to the ordinary that differs from the norm. This demands a research agenda that aims at making sense of the paradoxical balance between the unique and expressively varied qualities that identify the signature of a performing artist (Cohen, 2008). No previous research effort has, as yet, tested these identifying relationships over a wide-ranging and diverse number of virtuoso masterpieces selected from the solo repertoire. Neither have they re-defined the instrument and the role of the pianist in order to clarify the breadth of creative possibilities available to a great pianist and the means by which they may be synchronized and communicated.

All things considered, the signature voice of a highly accomplished performing artist can perhaps be described as a cultivated, larger than life presence that is *necessarily distinct* from the everyday personal mannerisms that identify one in the social arena.

In summary, underlying the thesis research reported here is the idea that artist pianists vary their performances through the use of expressively directed micro-timing, and that micro-timed variability is associated with an artist's aesthetically conceived "signature". The research hypotheses are

- that expressively directed variability in micro-timing can be revealed through amplitude time-line and spectrographic analyses of an artist pianist's performances;
- that individual artists will be found to be consistent in their use of micro-timing across performances spanning lengthy periods of time; and
- that individual artists will be distinct in their use of micro-timing compared to the performances of other artist pianists.

When listening to a moving performance it is often possible to obtain a general impression of what the artist is doing to achieve the effects obtained. However, it is not possible, without careful, detailed, close analyses of the performance to isolate what specifically distinguishes one artist's performance from another and that enables him or her to produce the identifiable effect that the listener experiences. The work in this thesis explores new ways of conducting such analyses. The long-term aim is to provide a bridge that will make possible future cross-disciplinary collaboration on what until now has remained elusive.

The next chapter introduces the methodology that will be used for comparative analyses employed to test this hypothesis.

CHAPTER 2

METHODOLOGY

This chapter describes the methodology employed in the comparative analyses used in the subsequent chapters. This methodology expands upon the ecological model employed by Pamela Korman to account for her comparative analyses of recorded performances of Maurice Ravel's piano music (Korman, 1996). In the present context, the comparative analyses of performances recorded in concert halls and studios are evaluated in a non-laboratory environment. Personal views of critically acclaimed artist performers, listeners and critics—alive and deceased—are derived largely from recorded interviews, biographies and commentaries (Scherer & Ekman, 1982; Gibson, cited in Greeno, 1994).

The signature voice of a highly accomplished pianist is identified in repeated, creatively varied performances of works selected from the piano repertoire as a whole. These performances are comparatively analyzed with each other and with performances of the same works by other highly accomplished pianists. The pianist's signature voice is able to be confirmed by its uniquely conceived and consistently varied musical features over time and circumstance. The concept of creative variability confines these repeated performances to a format that neither adds to, subtracts from or otherwise embellishes the notated score. The analytical considerations of the methodology and their applications are discussed in the sequence that follows below.

Comparative analyses: structural considerations, distinguishing characteristics, format and scope of the study

Selection of works for analysis

The works chosen for comparative analysis are selected from 215 recorded performances by 42 acclaimed concert pianists. All are frequently performed works drawn from the standard piano repertoire, chosen on the assumption that they are more likely to be accessible to readers. These range from compositions by Joseph Haydn in the late 18th century to Chopin in the 19th century and Alexander Scriabin and Sergei Rachmaninov in the 20th century. The compositional styles are therefore familiar to most listeners. Excerpts from specific works are comparatively analyzed in detail in order to clarify their distinctive performing features.

Recordings

The recordings cover the period from 1919 to 2010. Each is identified by a) the date of the original performance and/or a subsequent version, b) whether it was recorded in a live concert or a studio, and c) whether it has been re-mastered. The process used to record the original performance is also identified. This last point is an essential consideration because the recording process can provide valuable information related to a pianist's musical decisions. Early acoustic and electrical performances, for example, were recorded on both sides of a disc. The playing time of each side was normally restricted to a maximum of three to four minutes. This obliged some players to rush through passages that would normally take longer to play (Barere, 1928; Cortot, 1933; Moiseiwitch 1930; Rachmaninov, 1919). If corrections were needed, the player had to repeat the entire side

or work. The long playing, tape and digital recordings that followed allowed for more precise editing. Editing techniques have become increasingly more sophisticated over time.

***Score**:* The Urtext (original) score of each work comparatively analyzed was consulted when it was available. Edited scores published at the time of the recording were also consulted in order to clarify textual editing and related associations between performances and the given notation.

Metronome: When it was necessary to time a performance by hand, a Seiko Quartz Model SQM -358 was used. The contemporary hand held metronome is generally used to audibly and visually duplicate the notated overall tempo and a limited number of temporal modifications. It can, as well beat time to the fundamental beat and three or four sub-beats that are quicker than a second in duration. All of the above were employed in the present study when required as references for comparative performance analyses (Chapter 4).

Terminology: The terms *performing signature* and *signature voice* are treated as identical. Either or both may be used in any circumstance where they need to be discussed. The terms *individual voice* or *individual differences* are employed in discussions related to the performances of specific pianists in a given musical context.

Vladimir Horowitz's Signature Voice

Vladimir Horowitz's signature voice is employed as the main reference for comparative analyses of performances by highly accomplished pianists. The aim is to supply a guiding reference for future studies into the defining features of a major pianist's performing

signature. The exception is *Chapter 3: Micro-timing of a Sigh: Creative variability in milliseconds*.The chapter is confined to the comparative analyses and discussion of creative variability in performances by ten celebrated pianists of two brief excerpts drawn from Beethoven's Concerto No. IV for Piano and Orchestra.

The features that identify a highly accomplished pianist's performing signature are analyzed from the following perspectives.

Format for Comparative Performance Analyses

Comparative signature analyses of Vladimir Horowitz's repeated solo recordings, and for this works were selected from the piano repertoire as a whole. The performances chosen for analyses were for the most part recorded live. There were also comparative analyses between Horowitz's solo recordings of particular works with two or more pianists. An exception is a comparative analysis between one performance by Horowitz and one by Glenn Gould of a movement from a Haydn sonata.

The overall scope of the study, its format and distinguishing features add up to a comprehensive body of working references for a) comparing the signature voice of an artist pianist in a variety of demanding musical contexts and b) determining the specific expressive choices the pianist will make to creatively vary a musical score into a novel work of art. Creative variability and expressively directed micro-timing are the base line references for all comparatively analyzed performances.

Graph representations for analysis:

The Amadeus II music analysis software for Macintosh-Multi track Audio Editor was employed to visually represent individual performances. Each visual representation can be considered a distinctive post-performance score.

Amplitude Timeline Graphs

Amplitude Timeline graphs show the overall length of the recording and the metrical durations and amplitude intensities as they unfold over a specific period of time. The commercial software utilized for this purpose was "Amadeus II" by Hairer software, a 2-track sound editor that synchronizes the binaural amplitudes of the timeline, thereby allowing one to study, manipulate and analyze the audio files.

Reading the Timeline Graphs

Figure 2.1 presents an example of an amplitude timeline, which is to be read as follows. Other examples, discussed in the context of specific analyses, are presented in Chapter 5 and Appendix A.

a) a capital letter signifies the beginning and ending note(s) of the recorded example.

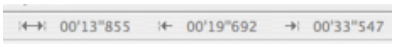
b) the lower case letters identify all other notes and their sequencing .

c) the spacing of the red vertical lines indicates the relative durations between notes.

d) the vertical lines that cross the graphs diagonally indicate durational parallels and distinctions between individual performances.

e) the expansions and contractions of the vertical black lines  from left to right indicate the breadth, amplitudes and degree~~s~~ of intensity of the horizontal timeline.

f) the variations in overall thickness of the black lines represent variations in performance amplitudes. Some examples have been amplified to highlight details as they occur along the horizontal timeline.

g) the series of numbers at the upper right hand side of the timeline graph indicate~~s~~ the timing elements (seconds,microseconds) of the overall time frame of the performance: For example, 

Gilels 00’13’’855 indicates the duration of the clip; 00’19’692 indicates the clip starting point in the entire audio file of the movement and 00’33”547 identifies the end of the clip in reference to the entire audio file. The numbers at the bottom of each graph represent durations at two-second intervals, unless otherwise indicated. For example, 00’20”000 ---00’22”000. The durations between articulated tones within the indicated interval will normally vary in milliseconds (see Figure 2.1 below).

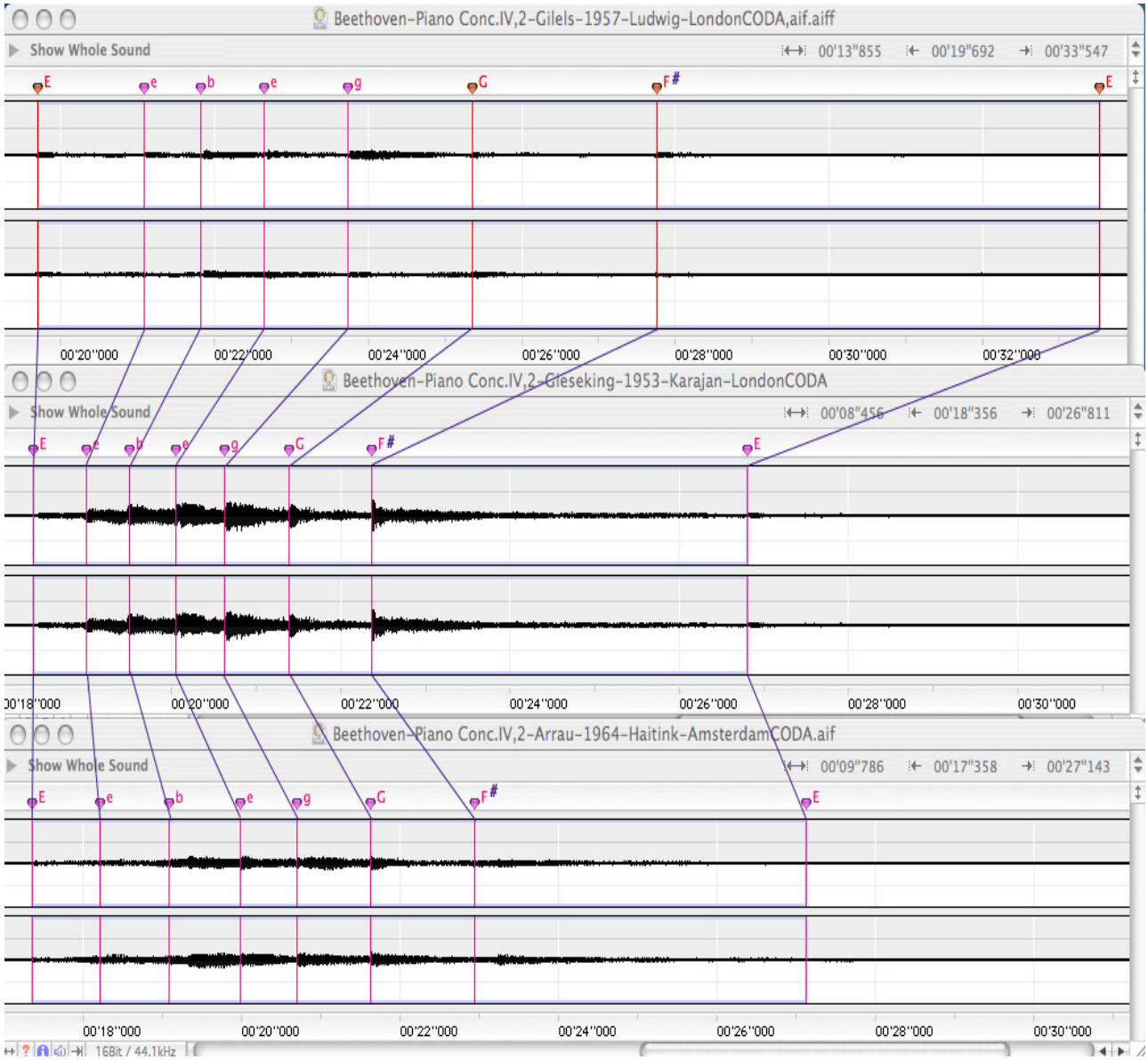


Figure 2.1 Amplitude Timelines. Beethoven Piano Concerto IV, 2nd Movement, Measure 72. Performed by Gilels, Gieseking, and Arrau.

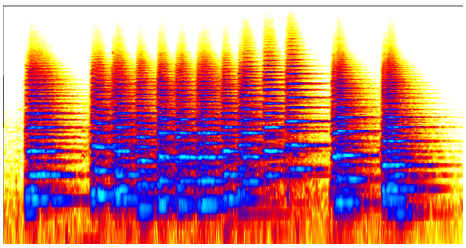
Spectrograms

Selected examples are visually represented by a spectrogram, which plots frequency (y-axis) against time (x-axis) showing harmonic durations, intensities of attack and timing relationships.

Reading the Spectograms: Color Code

A spectrogram is a visual representation of the timings, harmonic frequencies and intensities of an audio recording. It uses a variety of colors to visually represent these details by means of an FFT (Fast Fourier Transform) of the audio file. The colors are user specific and may range from shades of gray to the entire color spectrum.

In the present context, the spectrogram utilizes horizontal and vertical blue, orange, yellow and black lines to identify the following distinctions.



Blue indicates the loudest (most intense) tones while orange, yellow and black indicate tones that are progressively quieter. Orange and yellow usually graph the sympathetic vibrations of the primary blue notes in the audio clip. The width, length, shape, entrance and exit of these lines and their distance from each other indicate the resonating intensities of the different tonal levels. The color code, as a consequence, allows the viewer to make observations about specific tonal relationships and their timings. These include the orchestral dynamics as well as the pianist's attack, articulation, sustained tones and pedaled resonances (see Figure 2.2 below).

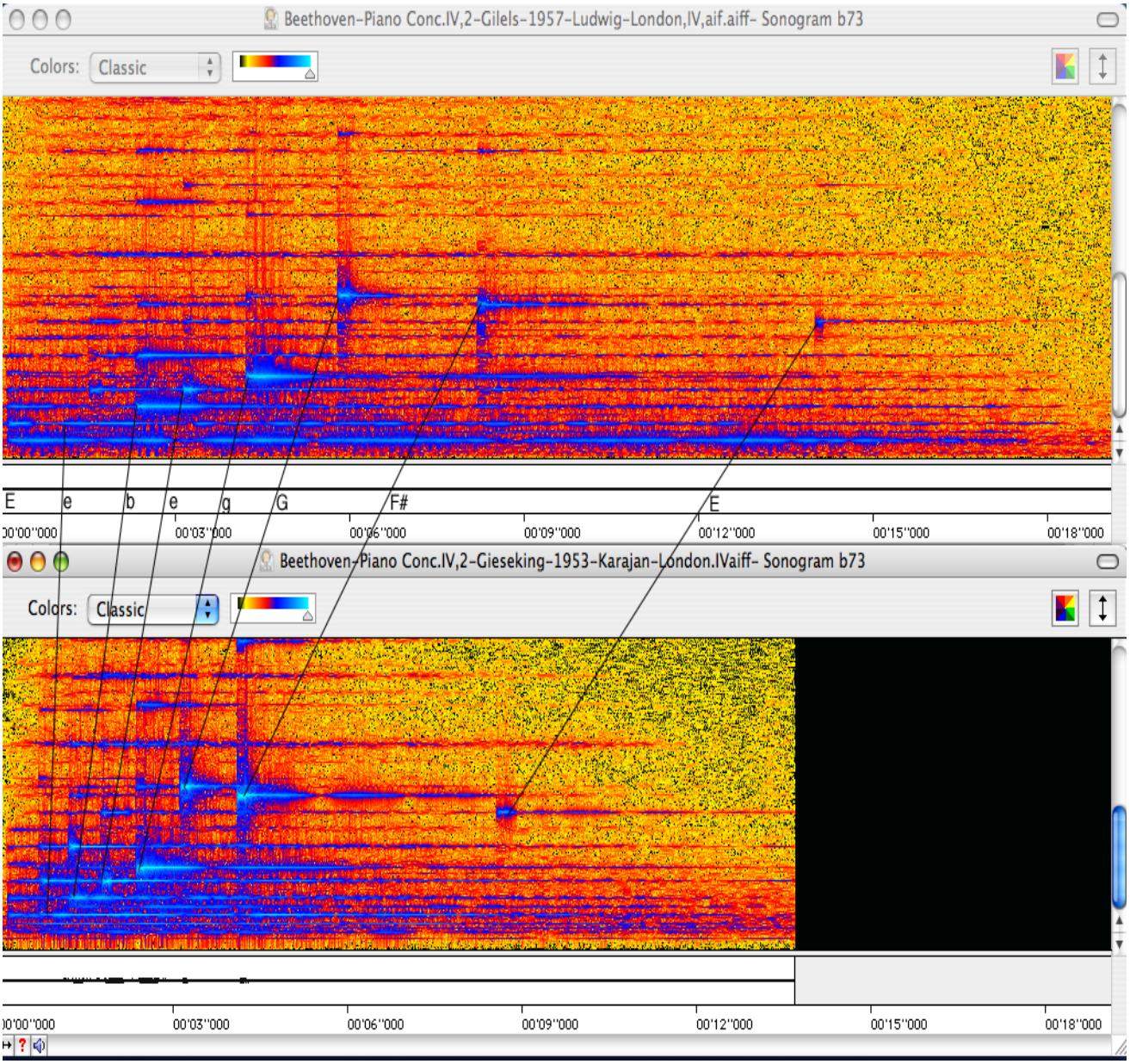


Figure 2.2 Spectrogram: Beethoven Piano Concerto No.IV, 2nd Movement, Measure 72. Performed by Gilels and Gieseking.

The problem of evaluating harmonic distinctions between different pianos brings up questions about authenticity that come with pedalings intended for an early 19th century piano that are later reproduced on contemporary concert grand. The harmonic resonances in the latter are so more intense and enveloping than the original, that to play them as notated would obscure the composer's intention. The spectrographic representation of the Beethoven excerpt shown above illustrates how even a relatively small pedaling modification by Geiseking was magnified by his keyboard articulations of the melodic line. These are observed in differences in the intensity and durations of the blue representations of note-to note entrances. This last point is expanded upon in Chapter 3.

Aural analysis: summary and commentary

Aural analysis summarizes and comments on the results represented in the combined Amplitude Timelines and Spectrographic analyses. Attention in aural analysis focuses on the relevance of the specific musical choices a pianist makes towards identifying his or her signature voice over time in repeated performances. These choices are discussed in terms of their expressively directed micro-timing and creative variability. Significant details that elude measurement require input from an experienced performer or performance analyst who is equipped to identify and explain the subtleties involved in creating the particular musical experience (Chapters 4, 5 and 6). Interpretation of all of these analyses are conditioned by James Webster's dictum: *The score is the truth and nothing but the truth, but not the whole truth* (cited in Taruskin, 1995, p.185).

The next chapter turns to the comparative analysis of variability between the micro-timings of artist pianists in their single performances of a major work.

CHAPTER 3

MICRO-TIMING OF A SIGH: CREATIVELY VARIED MILLISECONDS

The comparative performance analyses presented in this chapter develop the central argument of the thesis, namely that expressively directed micro-timing enters crucially into the performances of highly accomplished pianists. The analyses take a closer look at the nature of micro-timing, and demonstrate why it plays a key role in creative variability and in the formation of a pianist's signature voice.

The criteria for an artist-performer's timing of a brief sequence of notated tones can illustrate his or her distinctive musical choices. The passage may consist of less than a half dozen notes within or across a single measure. It may be written in strict time with no more than a suggestion that a single tone should be prolonged. The overall timing will take no more than a few seconds. Yet, within this limited framework, a highly accomplished pianist will select expressive choices that are not duplicated by any other pianist. The ability to do so illustrates how seemingly insignificant differences in note-to-note timing can be expressively directed independent of their overall duration. And, by implication, how these distinctions might enter into the listener's interpretation of the passage as a whole.

It occurred to me that it might be worthwhile to check out whether precise measurements of expressively directed micro timings might account for the subtle temporal distinctions one experiences in the performances of highly accomplished pianists. I accordingly conducted a quick check into the frequency of note-to-note durations of less than a second in the piano repertoire. I saw this as a first step towards

gaining insights into the role of expressively directed micro-timing in highly complex performance.

Pilot test

The test was conducted with a hand held metronome set to tick at one beat per second (technically 60 beats per minute). It immediately became apparent that the timings of note-to-note durations on the metronome are confined to three or four beats of less than a second. I assigned the term *mini-seconds* to label these durations. The passages tested were chosen from a selection of nocturnes, lullabies and virtuoso blockbusters recorded by major pianists. These included the *La Leggerieza* - a Transcendental Étude by Franz Liszt, Chopin's *Berceuse* and *Nocturne* in D flat op.27 No. 2, Debussy's Prelude *Minstrels* and the First Movement of Saint-Saëns's Piano Concerto No.2 op.22.

No attempt was made to calculate minute timing distinctions between widely different lengths.

The results were crude but nevertheless instructive. Not only were there many durations of less than a second in length—these outnumbered all other durations regardless of the context, length, tempo, stylistic or technical complexities of a particular work—there were faster speeds that eluded metronomic identification. That is, there were many durations that did not conform strictly to the metronomic indications. This variability in durations is what is of significant interest here. What is especially interesting is that given the speed (the shortness) of these durations, the artist has, in

principle, less opportunity to exploit duration for esthetic purposes, yet it would appear, as will be seen below, that this is exactly what the artist is doing.

The frequency of timings between tones and pauses that were less than three or four note-to-note durations under a second in length emphasized the need to employ micro-timed measurement to account for their musical significance. This was evident in the rapid leaps, shifting rhythms and scale passages of the virtuoso works tested. It was even more so in works such as Chopin's Nocturne and Berceuse where the overall mood depended on a subtly timed interplay between tones of widely different lengths**.** The predominance of expressive distinctions between note-to-note repetitions of the same passage suggested how artist pianist might employ expressively directed micro-timing to create musical experiences that are unique to the individual.

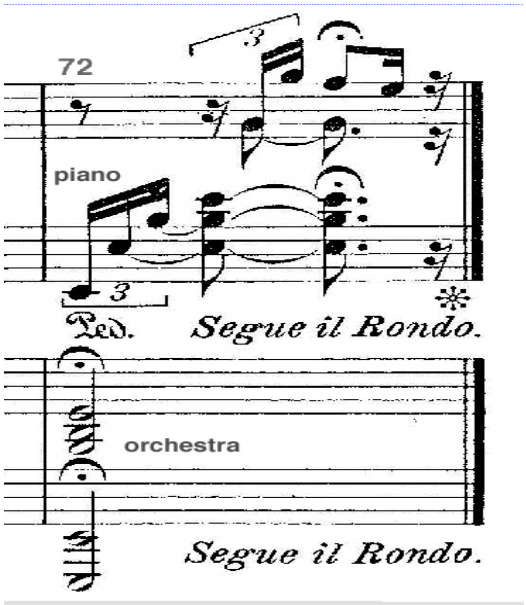
The challenges involved micro-timing expressive subtleties prompted the decision to confine the comparative analyzes in this chapter to brief motifs that might restrict, even inhibit creative variability. It seemed reasonable to assume from the metronome test that the fewer the available options, the more likely an artist pianist would explore novel solutions by means of expressively directed micro-timing. And by extension, the solutions chosen by an artist/pianist might provide clues to the pianist's individual voice. For example, in a passage that consists of only three or four notes a highly accomplished pianist might lengthen or shorten note-to-note timings without changing the overall durations. Comparative performance analyzes of this possibility might show whether the pianist employed expressively directed micro-timings of these durations to create a measurable balance between amplitudes, articulations and pedaled harmonic resonances. The aim, therefore, of the comparative micro-timing analysis was two fold:

1) To establish a starting point for analyzing the role that expressively directed micro-timing might play in communicating the individual voice of an artist pianist; and

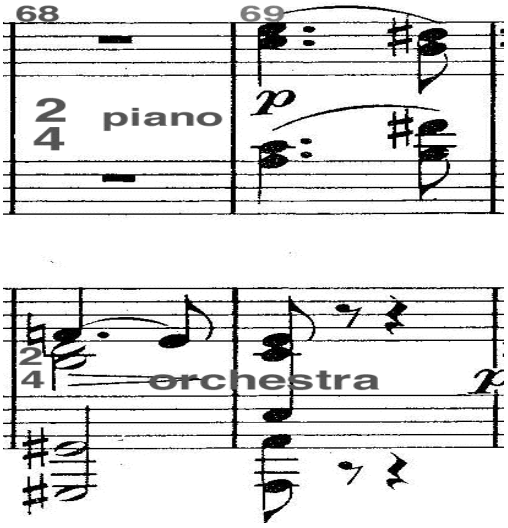
2) To question whether a major pianist could bring an aesthetic closure to a complex work with little more than a few notes at her disposal.

Comparative analysis

With the above in mind, two brief excerpts from recordings by ten major pianists of the 2nd movement of Ludwig van Beethoven's Piano Concerto No. 4 were selected for comparative micro timing analysis. The pianists were the following: Claudio Arrau (1964), Irid Biret (2008), Walter Gieseking (1953), Emil Gilels (1957), Helene Grimaud (1999), Yevgeny Kissin (2007), Anton Kuerti (1986), Lang-Lang (2007), Murray Perahia (1984) and Kristian Zimerman (1989). Both excerpts are located in the *coda* (finale) of the movement and consist of a small number of articulated tones in a time frame of a few seconds. The notated dynamic level in both excerpts is uniformly soft (p) and the tempo is constant. The melodic, rhythmic and harmonic options for variability are therefore restricted. The significant details of these two excerpts will now be discussed in turn.



Excerpt 1. Measure 72.Beethoven Piano Concerto No.4, II Movement,



Excerpt 2. Measures 68-69. Beethoven Piano Concerto No.4, II Movement

Excerpt 1.Measure 72 consists of eight articulated tones performed by the piano in duple (2/4) time over sustained low strings by the orchestra.

Excerpt 2. Measures 68 and 69 in duple (2/4) time are divided between the orchestra and piano. Measure 68 consists of two articulated tones by the orchestra's low strings. Measure 69 follows with two articulated chords by the piano.

Measure 72: The Analytical Process

The comparative analyses of expressively directed micro-timing in measure 72 employed the Amadeus II Amplitude Timeline and Spectrographic modalities. The Amplitude Timeline generated measurement (represented and measured) for note-to-note timings. The comparative micro-timing analysis of harmonic resonances and intensities were represented by Spectrographic analysis.

The analytical process is introduced with a synopsis of the notated metrical details of the excerpt and a listing of the overall performance timings of pianists compared in the study.

The aim here is to cue the reader into the notated details and timings of every note and its function for comparative performance analysis. These are described and explained with an emphasis on the sequencing of their notated duration.

Synopsis of notated metrical details (Figure 3.1)

The first beat of the measure consists of six notes in two groups of 16th note triplets (technically, a double triplet or sextuplet). The triplets are divided between the pianist's hands in an arpeggiated sequence that moves upward from the bass to treble clef as follows: E to E, B and E at the octave in the left hand bass. The last three notes remain sustained until the notated rest that completes the measure. The right hand treble completes the first beat with an octave leap from G to G. The lower G is sustained in unison with the bass. At the peak of the sequence, the upper G descends to the second beat on F-sharp. The *fermata* (pause) over the F-sharp is an 8th note synchronized with a *fermata* in the bass that sustains the lower notes of the piano with the orchestral

accompaniment. The *fermata* is followed by a 16th note on E and a 16th rest that completes the coda. Segue il Rondo directs the pianist and orchestra to proceed immediately to the third movement (a dance rhythm in Rondo form).

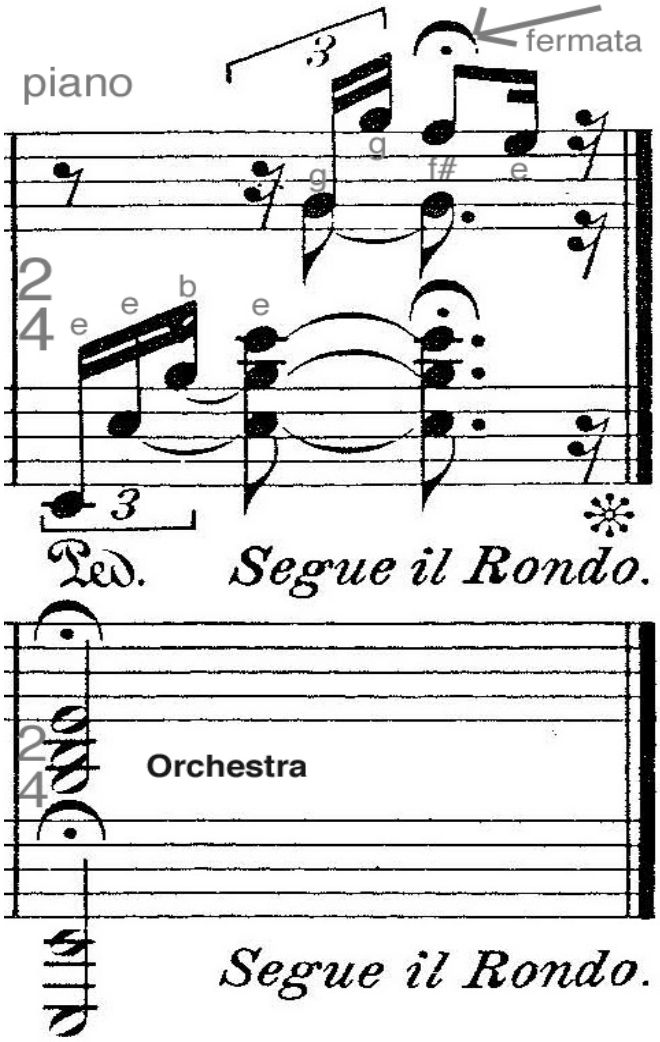


Figure 3.1 Beethoven Piano Concerto No.4, II Movement, measure 72

Because Gilels's variation in minutely timed note-to-note sequencing reflects the units of metrical timing relatively closely, his performance has been chosen as the reference model for comparative micro-timing analysis. It is for this reason that the representation of Gilel's recording appears in the topmost position of every graph. A single case example in Figure 3.2 below can be seen in the detailed Amplitude Timeline and Spectrograph representations that follow from the score. Shown here are striking timing differences in both the overall and note-to-note durations. A first glance of the Spectrograph representations of their performance shows the qualitative differences in the blue orange and yellow harmonic intensities, the breadth and length emphases of the blue colored note-to-note entrances and the blending of their performances with the orchestra. Taken together these distinctions account for the individual features of their performances. (See Appendix A Graphs 1-23 for the complete set of graphic representations.)

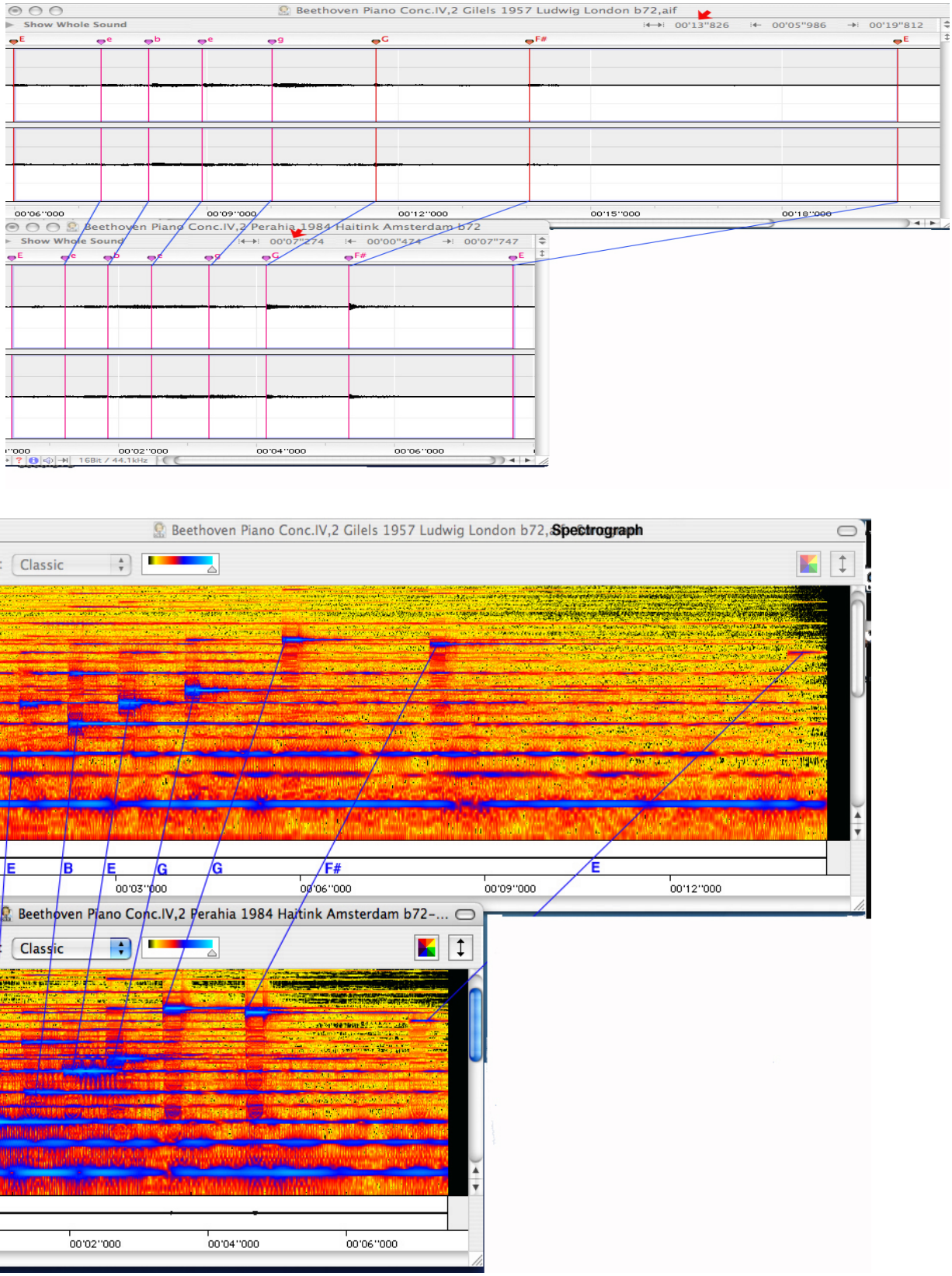


Figure 3.2 Amplitude Timeline (top half) and Spectrograph (bottom half) of Beethoven Piano Concerto No.4, II Movement, Measure 72, performed by Emil Gilels and Murray Perahia.

It is interesting to see the range of timings a group of artist-pianists will bring to the overall duration of a single measure. In doing so the measure is often not synchronized with the overall duration of the movement as a whole. Table 3.1 below lists the overall durations of measure 72 as well as the overall durations of the complete second movement as it was performed by each of the ten artist-pianists . These distinctions between individual durations were generated from the Amplitude Timelines of each pianist's performance. It is also interesting to see how none of these metrical deviations are consistent with the notated durations of Measure 72. For example Biret's performance of the final measure is the quickest of the entire group, but the fastest overall movemenet duration is that of Gieseking. Lang Lang's performance of the final measure is the longest in duration, whereas Kissin's overall performance of the movement is the longest.

Performer	Duration Measure 72 Min.s.ms.	Overall duration Of II Movement Min.s.ms.
1. Irid Biret	00’06”990	05’32”774
2. Murray Perahia	00’07”041	05’09”067
3. Walter Gieseking	00’08”450	05’04”467
4. Claudio Arrau	00’09”786	05’30”280
5. Anton Kuerti	00’10”244	05’53”000
6. Yevgeny Kissin	00’10”451	05’58”317
7. Helene Grimaud	00’10”835	05’38”667
8. Kristian Zimerman	00’12”133	05’37”440
9. Emil Gilels	00’13”855	05’26”734
10. Lang Lang	00’14”391	05’45”134

Table 3.1 Beethoven Piano Concerto No.4, II Movement, Measure72: comparative durations: quickest to longest. Overall durations of the II Movement.

Are these deviations from the score planned and deliberate or are they spontaneous? Or are they a matter of an artist-pianist's need to create a personal experience in every performance? The following comparative micro-timing analyses may not provide a definitive answer. They will, however, demonstrate how minute variations from the notated score can communicate completely different musical experiences.

Comparative micro-timing analysis:

There are at least three of important features of micro-timing events that can be comparatively analyzed in this context. These are

- Micro-timing of durations of note-to-note onsets in note sequences;
- Micro-timing of amplitude time lines and the manipulations of dynamic durations;
- Micro-timing of harmonic intensities and the melodic voicings they emphasize.

The expressively directed micro-timing of durations, amplitudes and harmonic intensities of measure 72 were compared in the following sequence: the opening note, the grouping of notes leading to the F# fermata, the F# fermata to the final note and the decay of sound from the final note to silence.

A single visual representation selected from the performance of each pianist has been employed for detailed analysis. All other visual representations can be found in Appendix A and will be referred to more briefly.

Duration of note-no-note onsets

The Amplitude Timeline graph representing performances by Gilels, Lang Lang and Kissin are a case in point (Figure 3.3). All three pianists lengthened the first note of

the double triplet to within milliseconds of each other. Gilels continued upward by increasing the speed of the second note before micro-timing a note-to-note *ritardando* that settled on a lengthy F# fermata. Lang Lang's opening tone was longer than that of Gilels. He followed by increasing the speed of the next three notes before slowing down incrementally to the longest fermata in the micro timing analysis (see Table 3.2). Kissin, in contrast to both Gilels and Lang Lang, followed the slow entry by increasing the speed of the next two notes, then tripling the speed of a single note before *ritard*ing gradually until the decay of the final tone. Figure 3.3 illustrates how they time the durations of the two opening notes and how the duration of the F# fermata will set the stage for the quality of the entire musical experience. These millisecond distinctions point to their reliance on expressively directed micro-timing to communicate their musical intentions. Table 3.2 represents the above with precise measurements. All individual durations are compared with Gilel's timing in this context.

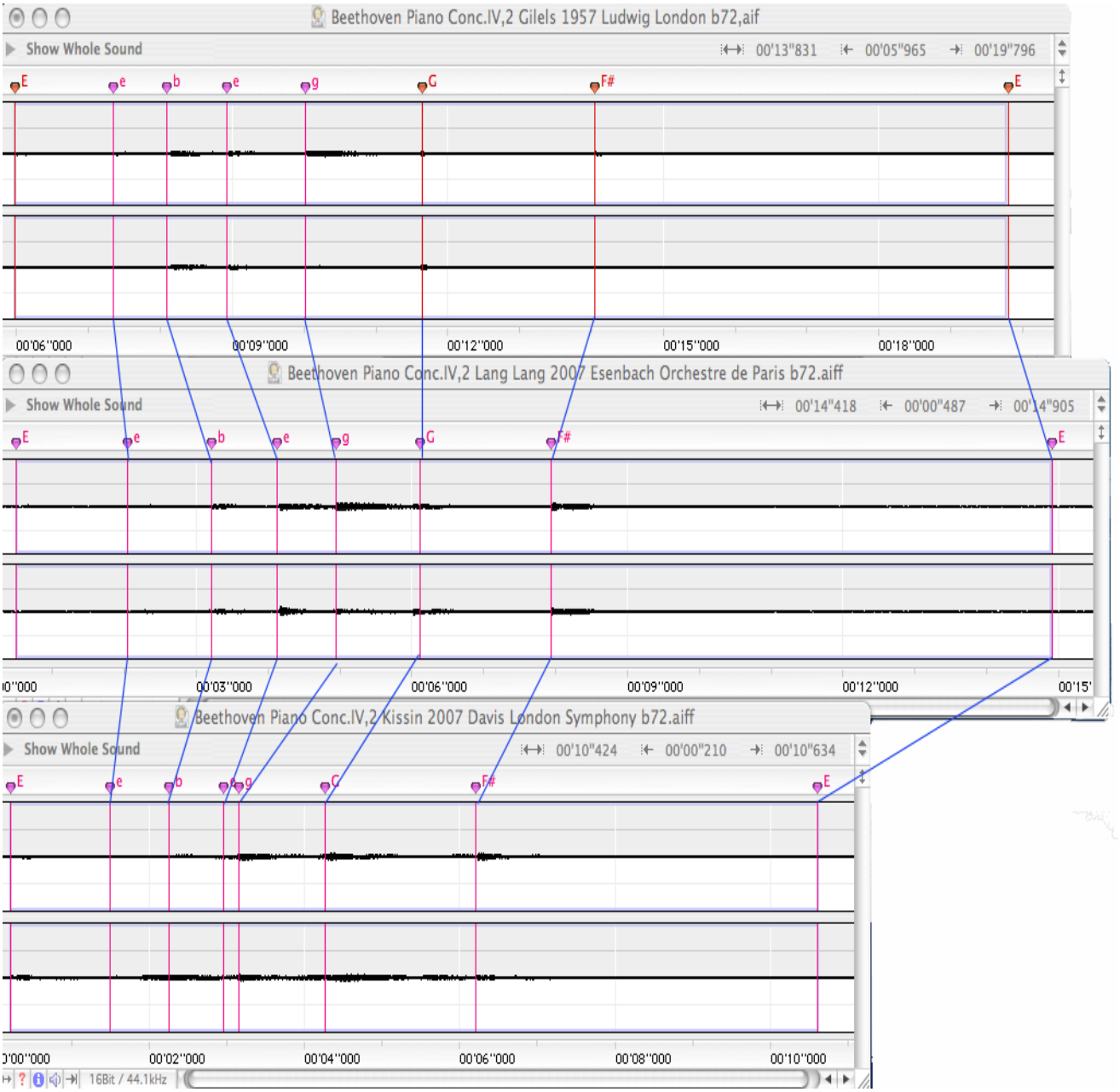


Figure 3.3 Amplitude Timeline: Beethoven Piano Concerto No IV.2 Movement. Measure 72 performances by: Gilels,Lang-Lang,Kissin

PERFORMER	Elapse of time E-e Min.s.ms.	Difference From Gilels Min.s.ms.	Duration of F# Fermata Min.s.ms.	Difference From Gilels Min.s.ms..
Gilels	**00’01”472**		**00’05”817**	
Lang-Lang	00’01”828	+00’00”356	00’07”184	+00’01”367
Kissin	00’01”411	- 00’00”061	00’04”467	-00’01”350
Arrau	00’01”250	- 00’00”222	00’04”135	-00’01”682
Biret	00’00”803	- 00’00”669	00’03”045	-00’02”772
Gieseking	00’00”566	- 00’00”906	00’04”505	-00’01”312
Grimaud	00’01”303	- 00’00”162	00’03”788	-00’02”029
Kuerti	00’01”156	- 00’00”316	00’04”623	-00’01”194
Perahia	00’00”763	- 00’00”709	00’02”394	-00’03”423
Zimerman	00’02”120	+ 00’00”648	00’04”761	-00’01”056

Table 3.2 Beethoven Piano Concerto No IV.2 Movement. Measure 72. Comparative note-to-note durations (Generated from Graph 1-5, Appendix A)

Amplitudes time lines and dynamic durations

The second feature of durations that can be analyzed are the amplitude timelines and dynamic durations. Comparisons between amplitudes showed individual variation in the versions of the notated sequencing of quiet unstressed tones (p-pp) that made up the excerpt. Spectrographic analysis identified the exact position of every articulated tone and the intensity and decay of its harmonic resonances. These were represented in the blue (harmonic intensity), orange and yellow (sympathetic resonance) lines. The added vertical lines connecting spectrographs to each other provided a comparative representation of significant details and their timing. Spectrographic analysis therefore complements the temporal positioning of the timelines by showing the harmonic intensities of their amplitudes. Figure 3.4 below illustrates an example of striking differences between two performances of the same motif.

Other examples are presented in Appendix A. Most significant are the subtly timed differences in the note-to-note amplitudes of the melodic line in every performance at every level of intensity (see Graphs 1-5 in Appendix A). These range from the barely visible representations of Gilels, Lang Lang, Zimmerman and Kuerti (Graphs 3 and 4) to the strongly defined intensities of Gieseking, Arrau and Perahia (Graphs 1 and 5). (See also Graphs 6-14, Appendix A.)

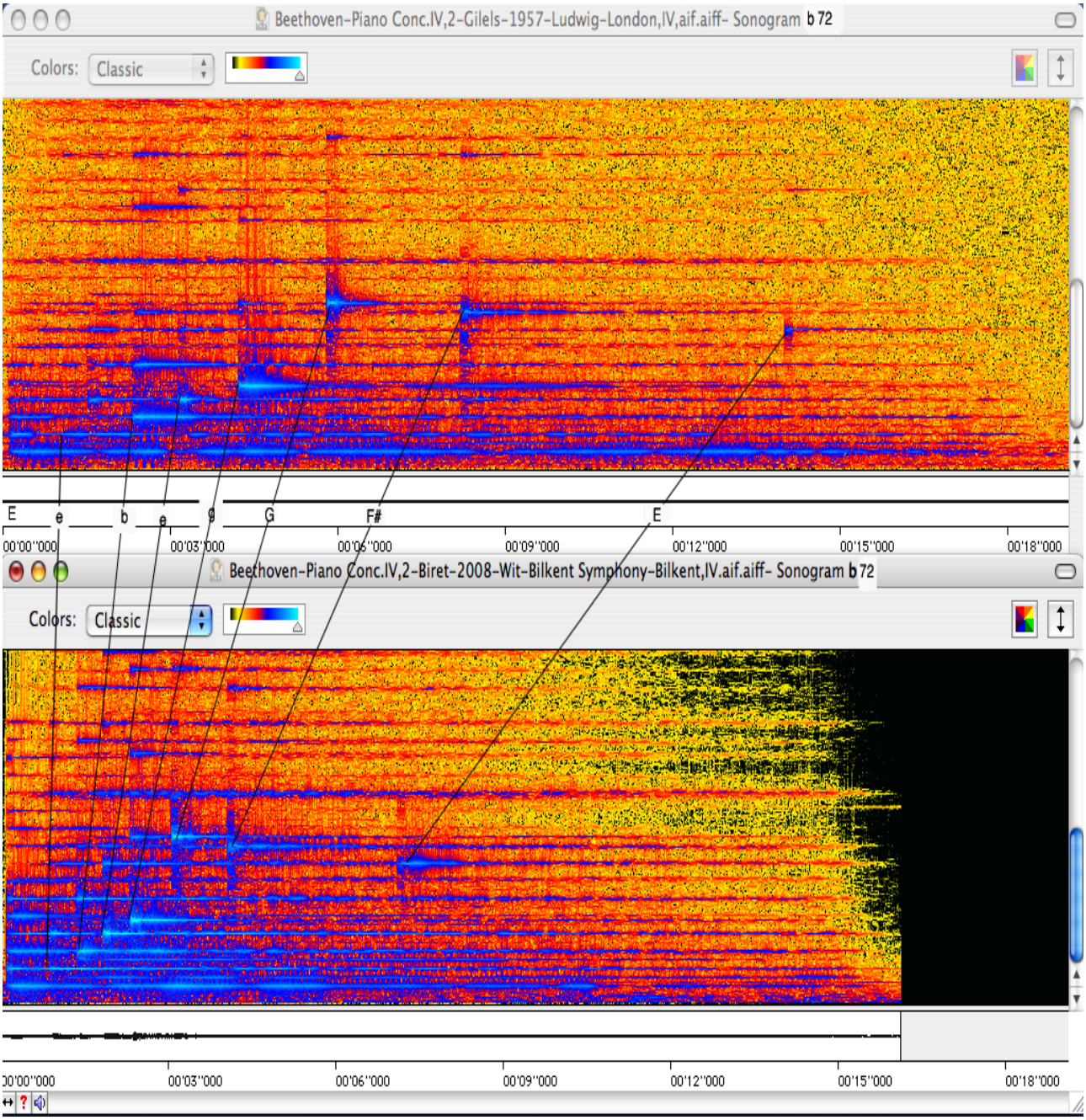


Figure 3.4 Spectrograph: Beethoven Piano Concerto IV. 2 Movement, Measure 72 performances by: Gilels and Biret.

Harmonic intensities and melodic voicings

The pedaling indicated by Beethoven over the sustained notes in the bass clef increases the intensity of harmonic resonance. When performed on a contemporary concert grand piano the combination of sustained tones and pedaling might blur articulations throughout the measure. The sustained orchestral strings can obscure the musical lines even further. If uncalled for resonance occurs during a recorded stage performance, the pianist may have to micro time changes, on the fly, in her pedaling, tone and touch (Grimaud, 1999; Zimerman, 1989). These issues are important considerations when one is interpreting a spectrographic representation in terms of the pianist's expressively directed micro timing.

The opening bass notes in all of the performances analyzed here were characterized by individual differences in the degrees of harmonic intensity. Minimal differences between the compared intensities were indicated in the onset tones through to the treble clef of Gilels, Kuerti and Zimmerman (Appendix A: Graphs 11 and 14). The incremental thinning out of the lowest blue lines in all three representations suggested a command of overall resonance that was micro timed to expressively direct the balance between, touch, tone and pedaling. Equally significant in all three examples were the gradual increases in horizontal and vertical degrees of sympathetic resonance. This suggested a sensitively micro-timed balance between the resonating amplitudes of the piano and orchestra. In contrast, the bass lines of Arrau, Biret and Gieseking showed intense levels of harmonic resonance (Appendix A: Graphs 6, 7 and 8). Thickly packed blue lines enveloped the sustained bass tones in all three representations. This made it difficult to visually identify the opening tones of the melodic line. Distinctions between

harmonic intensities were more clearly represented in the treble clef. This was due to slight increases in sympathetic resonance that allowed for the blue covered melody notes to be visibly distinguished from each other. Gieseking's horizontal intensities, for example, showed a series of pulsations and decays leading to the final tone. The horizontal intensities in Biret's representation thinned out rapidly to complete the final three tones. Arrau's final tone rested entirely on sympathetic resonance.

These results show how highly accomplished pianists employed micro-timing to creatively vary a minimum number of notes in a time frame of a few seconds. Rather than limit one's expressive choices, these constraints were shown to inspire each pianist to creatively vary the excerpt as a whole into a distinctive musical experience. Distinctions, for example, in the micro-timing of durational relationships were shown in the contractions (quicker) and expansions (slower) represented by the Amplitude Timelines connecting individual representations to each other. The visual representations of the final measure in both Amplitude Timeline and Spectrogram graph provide evidence consistent with the idea that the overall and internal timings of each performance and the accompanying durations, amplitudes and harmonic resonances were creatively varied by each pianist. Micro-timed variability between performers, was, for the most part, the dominant factor in every instance. Most striking were the marked differences in duration between the F# fermata and E and the wide variety of micro timed distinctions between the six notes that preceded it.

The aesthetically nuanced distinctions between these performances suggest that expressively directed micro timing may be an essential component of creative variability. Creative variability like jazz improvisation relies on subtle turns of phrase that is micro

timed on cue, with minimum reflection (Iyer, 2002). Carried a step further an individual voice could be inferred from the spontaneous nature of these minute choices. If so, micro-timing, on cue, reflects Vladimir Horowitz's dictum that the "smaller details" are best left to the "spur of the moment"(cited in Frost, 2003).

All things considered, questions remain: Why did every pianist feel it necessary to creatively vary a minimum number of notes within duration of a few seconds at a particular moment in the concerto? Does it imply that a performing artist feels compelled to stamp one's work with a signature that is unmistakably one's own? Before dealing with these questions one must first look at how each of the artist pianists in the study joined with the orchestra to bring the second movement of Beethoven 4th concerto towards its conclusion.

The single case example (Figure 3.5/a and 3.5/b) below shows how a dramatic esthetic difference based solely on a performer's specific (synchronization) of a minute temporal distinction between two notes (beats) can be experienced (perceived) by the listener as a unique musical event.

Details for analysis

The letter E between the two spectrographs identifies the top note of the entering chord. The letter D# identifies the top note of the exiting chord.

The first black line points to the entrance of the chord at the vertical orange and the horizontal blue lines. The second, thinner black line points to the exiting chord.

The black circular line shows the harmonic intensities of the orchestra approximately two seconds before and two seconds after the entrance of the piano. The piano adds additional resonance when it enters. This can be seen in the change of density of the blue color at the entrance of the piano on the note E in Measure 69.

In the context of the present study this achievement is due to the player's mastery of expressively directed micro-timing. Gilels, for example, blends with the orchestra in measures 68 and 69 with little dynamic emphasis in his entrance and a slight lengthening of the note that follows in measure 69 (seen in the moderate degree of harmonic resonance indicated in the barely discernable blue representation of Figure 3.5/b.). This leads to the mutual timing of a sigh between the orchestra and piano in the final measure. Gieseking, on the other hand, interrupts the orchestra with a sharply accented emphasis on his entering notes (seen in the lightning up in the blue representation of Figure 3.5/b). This draws attention to the leading role of the piano that concludes the movement with a rushed and impatient sigh.

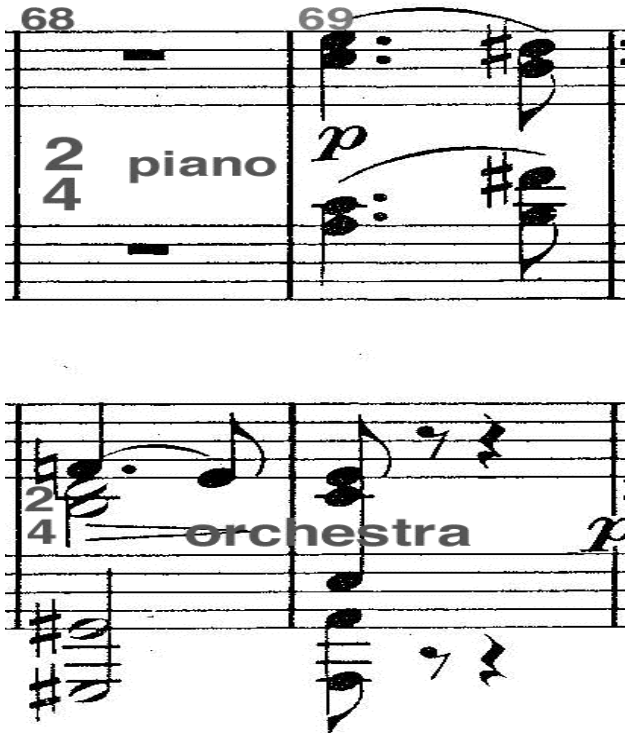


Figure 3.5/a. Beethoven Piano concerto No. IV, 2 Movement, Measure 68-69.

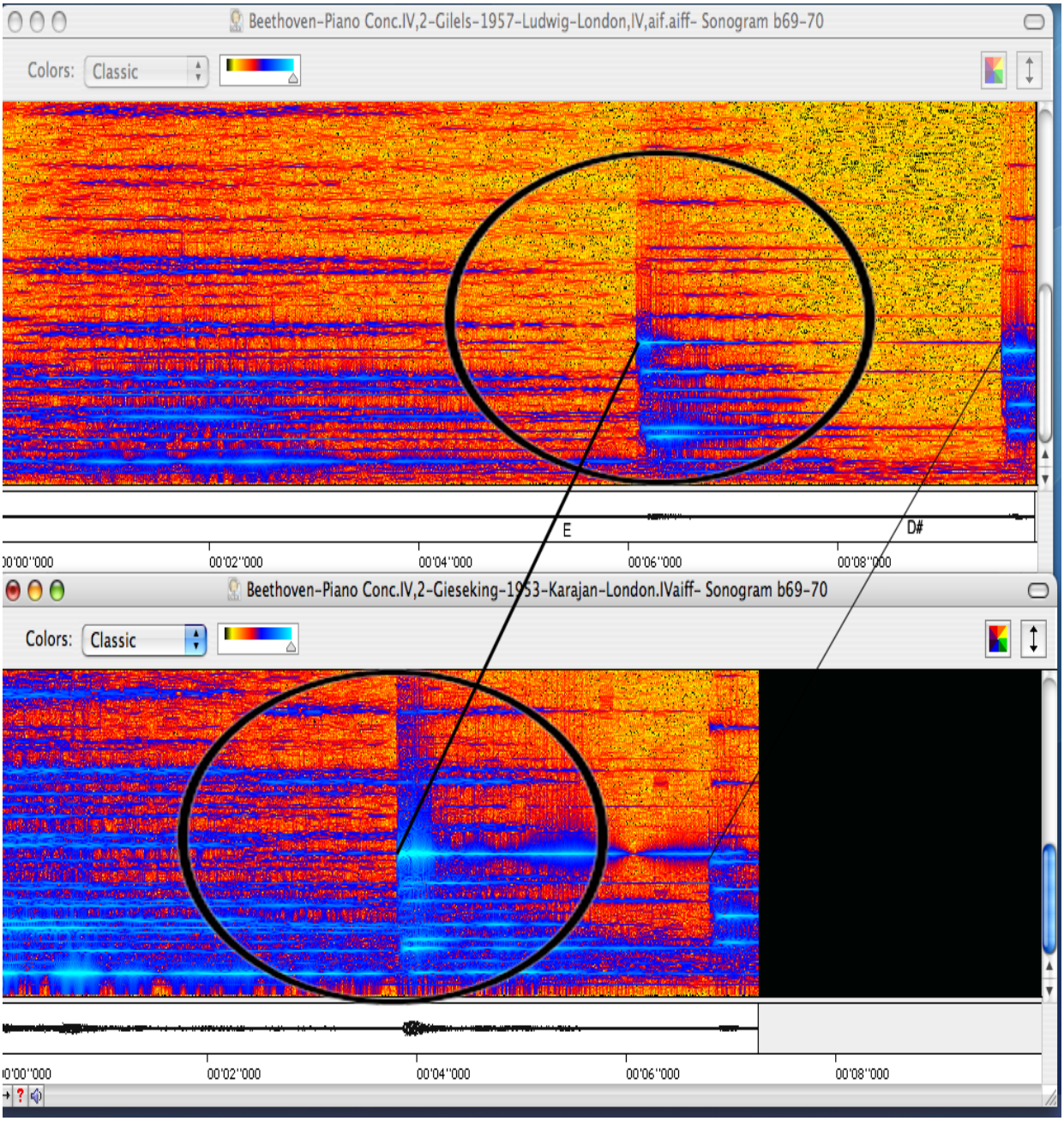


Figure 3.5/b Spectrograph: Beethoven Piano Concerto No.IV, 2 Movement, Measures 68-69.Performed by Emil Gilels and Walter Gieseking.

Summary

The comparative performance analysis of these two measures dealt with a single issue: the pianist's expressively directed micro-timing of the entrance through to the exit of the piano at measure 69.

Gilels entrance at measure 69 is shown to coincide with the decay of orchestral resonance in measure 68. The entering note (E) dissolved into a lengthy decay before leading to the final note (D#). The sequence from orchestra to piano is represented in the vertical and horizontal sympathetic resonances. These indicate a reduction of orchestral harmonic intensities before and after the piano entered.

In contrast, the predominance of thick blue lines surrounding Gieseking's entrance show intense levels of harmonic resonance. The sequence from orchestra to piano is marked by vertical and horizontal blue lines in the lower register. These thin out slightly in the upper register milliseconds before the entrance of the piano. The piano enters with a strongly marked harmonic intensity that decays in a series of pulsations until the final D#. These pulsations are usually achieved by the pianist by means of note-to-note micro-timing of pedalings. As mentioned earlier the comparative expressively directed micro-timings of the excerpt showed two aesthetically contrasting approaches to the entrance and exit.

The discussion that follows below is a brief overview of the same excerpt by six other pianists whose performances were comparatively analyzed for the study. These are shown in the Amplitude Timelines and Spectrographic representations in Appendix A.

Soloist or Accompanist?

The entrances and exits of the other pianists showed varying degrees of harmonic resonance. Kuerti, Zimerman and Grimaud timed their entrances and exits with minimal to moderate harmonic resonance on the melody notes. The unbroken flow from orchestra to piano may imply that these pianists, like Gilels, intended the piano chords to be heard as extensions of the orchestral line (Graphs 18, 23 and 20 Appendix A).

Biret, and Kissin timed their entrances and exits with strongly defined harmonic intensities on the melody notes. This suggests that, like Gieseking they intended to be heard as concerto soloists who were accompanied by the orchestra (Graphs 16 and 19 Appendix A).

The orchestral line leading to Arrau's entrance is marked by blue horizontal lines indicating considerable harmonic intensity. Arrau's entrance, however, shows less intensity than that of Gilels. His final D# is surrounded by yellow sympathetic resonance between decaying blue lines (Graph 15, Appendix A). These varied distinctions between the performances of highly accomplished pianists and the focus of each on a choice between two contrasting modes of performance practice add up to a compelling argument for expressively directed micro-timing.

Ten Well Timed Sighs: Summing up the 2nd Movement of Beethoven's Concerto No. 4 in G Major.

A brief overview of the 2nd movement (Andante con moto in e minor) of Beethoven's Concerto No.4 in G Major is included here to show the dramatic contrasts that characterized this work in terms of how it was summed up by ten great pianists. The

excerpts selected for comparative analysis (measures 68, 69 and 72) are in the final five measures of the movement. These contrasts are evident even in overall durations.

The recorded performance timings of the entire movement ranged from 5:04 to 5:58: a difference of approximately 18 %.

Performer	Overall duration
1. Irid Biret	05’32”774
2. Murray Perahia	05’09”067
3. Walter Gieseking	05’04”465
4. Claudio Arrau	05’30”280
5. Anton Kuerti	05’53”000
6. Yevgeny Kissin	05’58”317
7. Helene Grimaud	05’38”667
8. Kristian Zimerman	05’37”440
9. Emil Gilels	05’26”734
10. Lang Lang	05’45”134

An overview of the score

The dramatic character of the movement is established by means of alternating contrasts between the march-like dotted note beat of the orchestra (measures 1-5) and the lyrical, chorale emphasis of the solo piano (measures 6-13.) See figure 3.6 below.

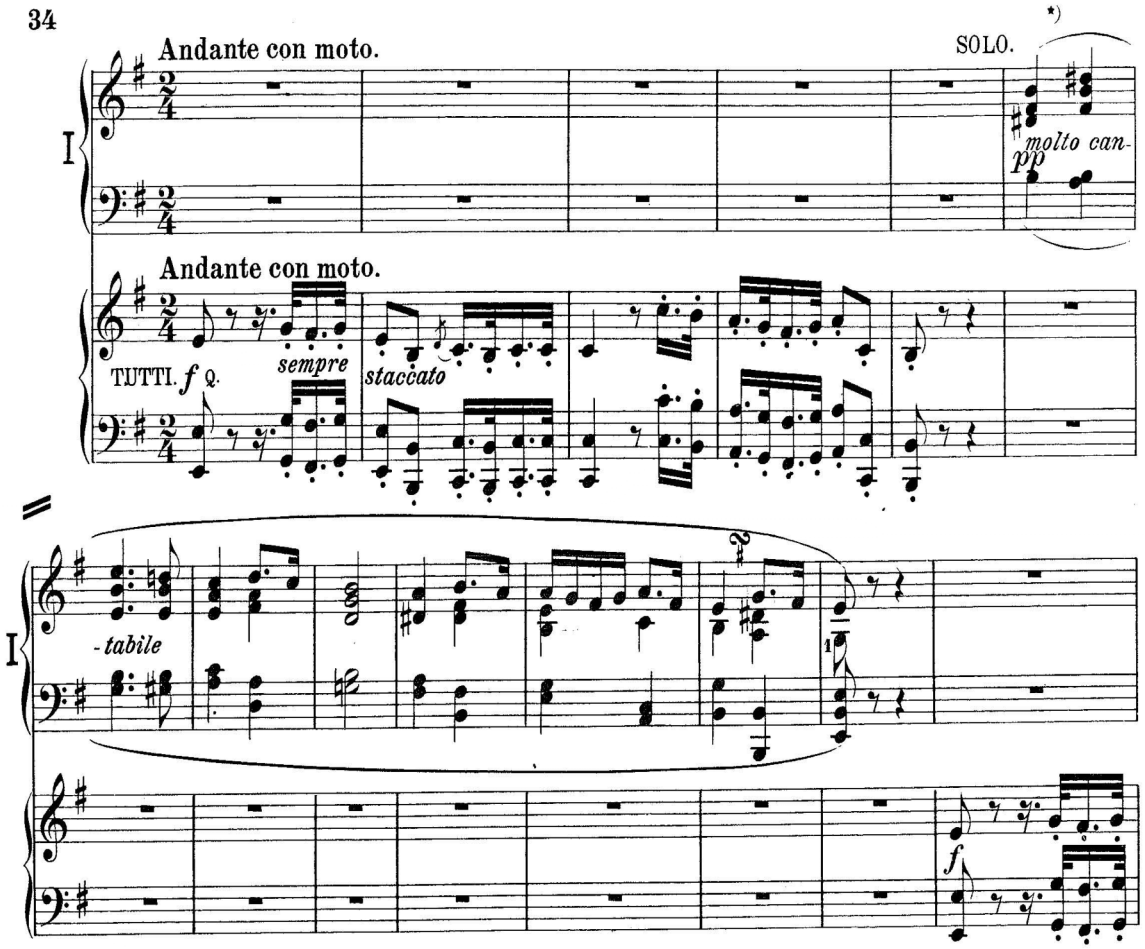


Figure 3.6 Beethoven Piano Concerto No.4, II Movement, measures 1-14.

The alternating passages are subsequently compressed into shorter motivic exchanges between the orchestra and piano (measures 26-46). The piano breaks away (measures 47-54) into a solo melodic passage (Figure 3.7) that leads into a cadenza (measures 56 -64).

The discussion of the movement as a whole would be incomplete without noting the emotional demands imposed on the performer by a context that keeps shifting from dramatic to lyrically expressed phrasings. The crucial role of expressively directed micro-timing in communicating these contrasting musical experiences cannot be underestimated. Hence the Timing of a Sigh in creatively varied milliseconds.

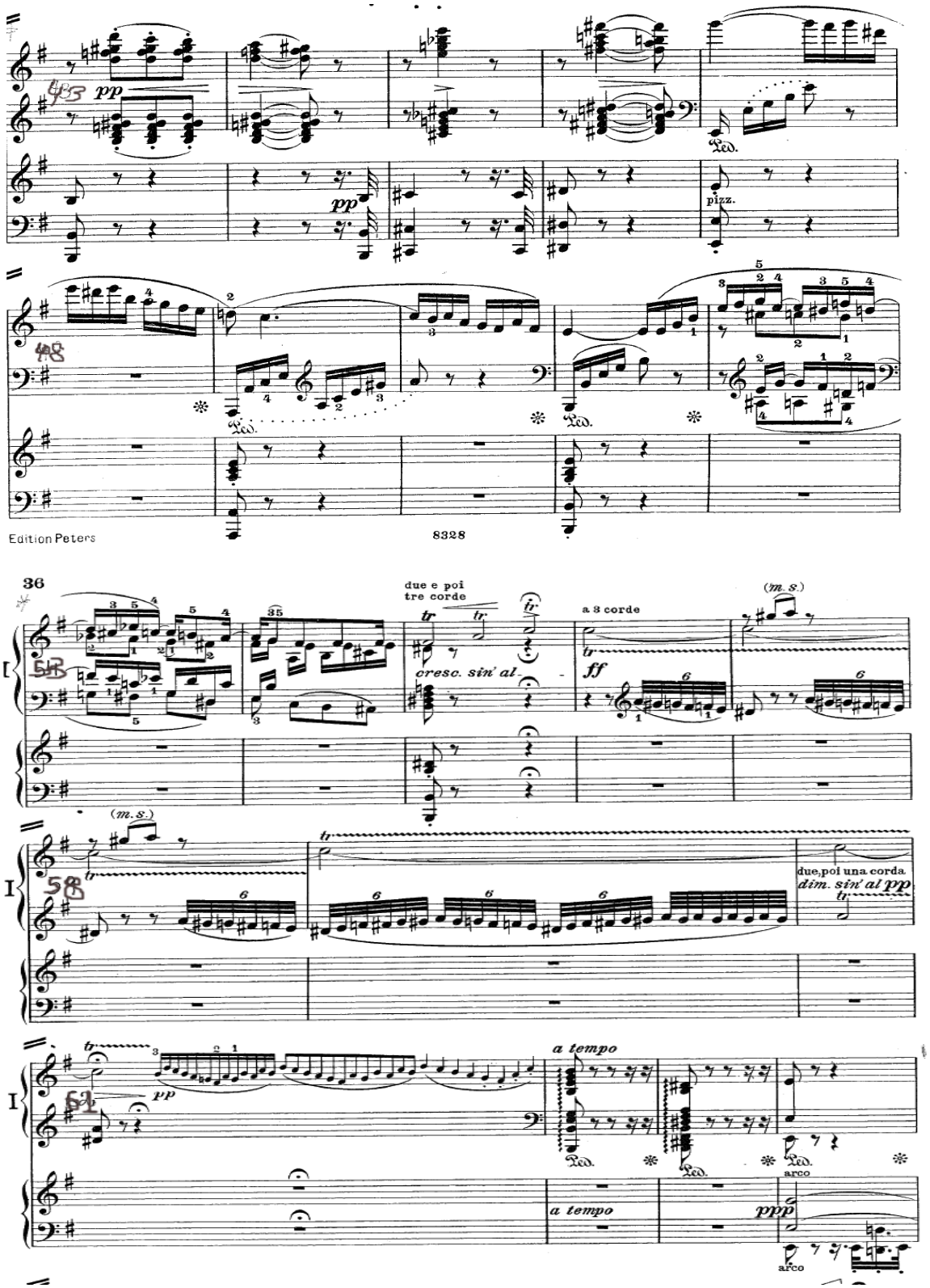


Figure 3.7 Beethoven Piano Concerto No.4, II Movement, measures 43-64

The cadenza resolves at the coda with the return of the solo orchestra (measure 64 Figure 3.8). The orchestra repeats a fragment of the march-like theme (notated ppp, very quiet) before dissolving into a sigh-like motive (measure 68). The piano enters, repeating the motive quietly (measure 69). The movement ends (measure 72) with a piano arpeggio (notated *p*, softly) over a sustained orchestral pedal tone (notated *pp,* softer) that culminates in a three-note "sigh' figure by the piano in the treble register.

Is this last utterance of the piano a sigh of relief?

The inscription Segue il Rondo under the final measure is Beethoven's instruction to proceed, without hesitation to the rondo movement that follows.

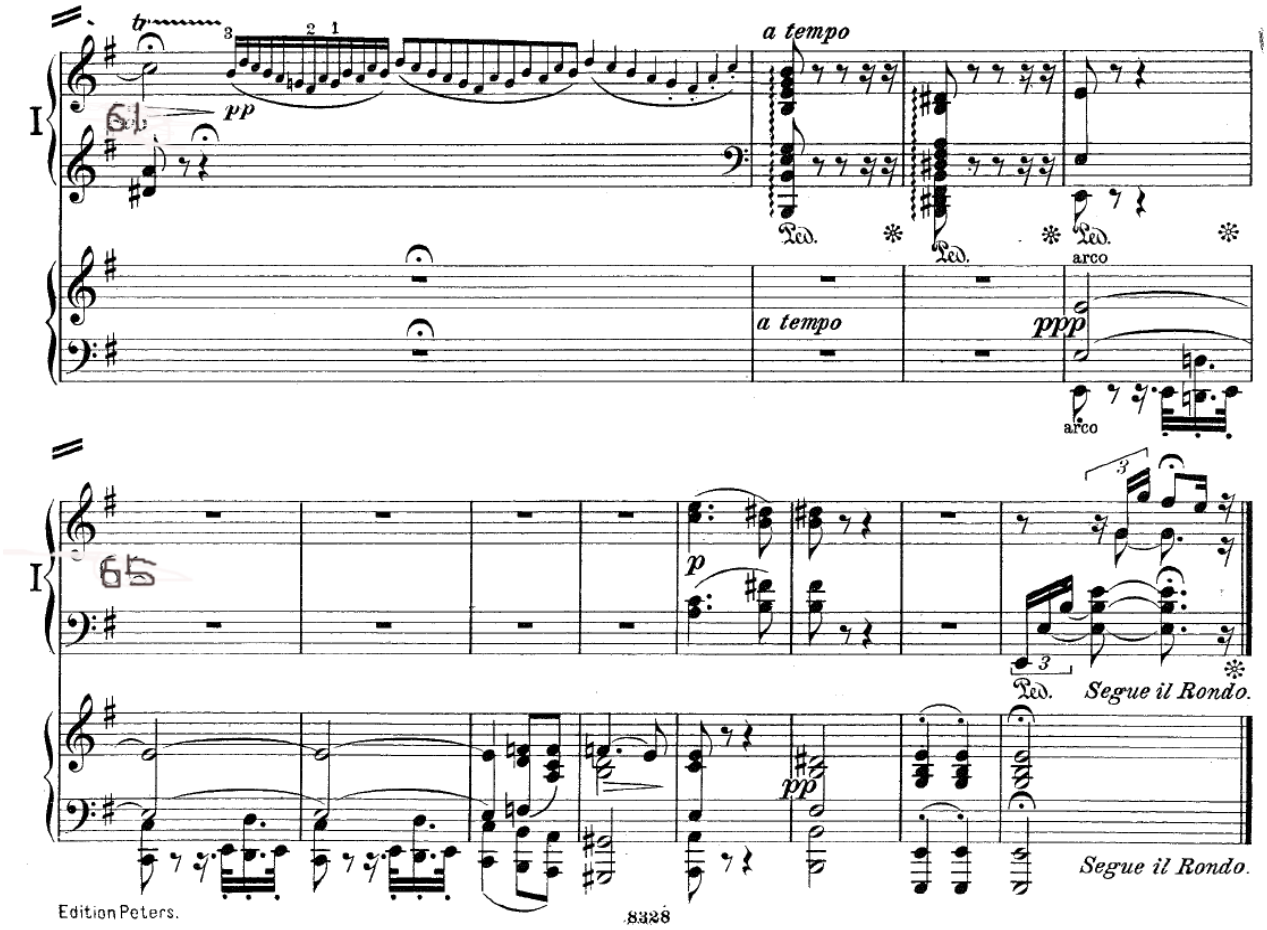


Figure 3.8 Beethoven Piano Concerto No.4, II Movement, measure 61-72

Conclusion

Not one of the ten pianists performed the final measure of Beethoven's precisely notated score as he wrote it. Each chose to re-organize the timing of the entire measure into a preferred tempo marked by retards, accelerations and pauses. The opening beat was replaced by ten different note-to-note variations of the double triplets. The *fermata* introducing the second beat varied widely in length, amplitude and harmonic intensity as did the decay of the final note (Graphs Appendix A). Beethoven's combined finger and pedal sustain of the bass clef triplet was treated differently by every pianist. The range of individual deviations from the score support the concept of expressively directed micro-timing as a key factor in the execution of creative variability.

The entente between creative variability and expressive directed micro-timing will be discussed in more detail in the Signature Chapter that follows. The focus will shift to the issues involved in defining a great artist's ability to employ the entente as a means for expressing one's signature voice.

CHAPTER 4

THE WELL TIMED MUSICAL SIGNATURE

A music composition, painting, sculpture, novel, play or poem by an accomplished artist can, under certain conditions, be distinguished from that of other artists in the same genre. The most obvious condition is the familiarity of the work. A specific work and its creator often become indistinguishable over time, repetition and universal celebrity. The resulting familiarity can involve nothing more than a naïve association of the work with a particular artist. It follows that it is unlikely- even to the untrained eye – to mistake the Mona Lisa as a portrait by anyone but Leonardo da Vinci. Neither is it likely that an untrained ear might confuse Beethoven's Fifth as a symphony by Mozart, Haydn or any other composer. In the former, the artist's name and the subject's face are imprinted in the common memory. In the latter, the four note opening motive and the composer's name are heard as one.

The features, however, that associate a specific work with a particular artist may be unmistakable, but they do not necessarily constitute a defining signature. Neither will mere familiarizing oneself with Beethoven's or Leonardo's larger body of work necessarily provide clues to their individual signatures. A signature evolves over time, circumstance, maturity and, most important, creative experimentation. Creative experimentation is the quality Beethoven and Leonardo shared with Mozart, Haydn, Chopin, Liszt, Stravinsky, Michelangelo, Picasso, Shakespeare and other supremely gifted artists. Beethoven's piano sonatas op.110 and op.111, Chopin's Polonaise-Fantasy, op.61, Mozart's Jupiter Symphony, Shakespeare's Tempest are apparently as distinct

from their previous works in the same genre as they are from those of other artists. The features that identify a particular artist's signature over time may be too subtle for the untrained observer to detect but can generally be shown through informed comparative analysis. Leonardo's equestrian sketches, for example, share certain features with similar works by Bernini and Michelangelo. Yet, on a comparative examination of the bronze casting, design and expressive gestures of the sketches, one can clearly distinguish Leonardo's work from the others (Hibbard, 1965).

The aesthetic experience: documentation, communication and the pianist's musical voice.

Paintings, sculptures and literary works exist as documents fixed in space and time. They can be seen, read, studied and their significance interpreted. They can be expanded upon, reduced or otherwise revised, but they will always remain documents. Notated music compositions also exist as documents, at least until they are performed. Once performed, they are transformed from fixed entities into living experiences that unfold in real time. The moment the music ends the experience will continue to exist solely in the subjectively interpreted memories of its players and listeners.

The transference of music from a piano score into an aesthetically convincing experience depends on the pianist's communication of sound qualities that require more than her sensitive ear and technical skills (Cohen, 2008). She requires, first of all, an instrument that can effectively communicate what she hears. While this is self-evident, it is important to emphasize the fact that a pianist's musical voice, unlike that of a singer, is expressed through an instrument outside of her body. The qualities of sound she wishes

to communicate depend, first of all, on how well the instrument responds to the expressively directed movements of her fingers and feet (Smith, 1978). For an artist-pianist, the need for an instrument capable of expressing her personal voice is of paramount importance. This need has inspired a long-standing exchange between pianists, composers and master builders. The evolution of these exchanges over the years has, in turn, provided valuable insights into what constitutes a highly accomplished pianist's signature voice. This will be discussed below in terms of a) an unprecedented leap forward in the evolving sequence during the 19th century, and b) its subsequent implications for the analysis of a contemporary pianist's signature voice. The discussion will be followed by Chapter 5 (Horowitz: comparative performance analyses).

The Signature Voice: technology and the composer-pianists

Technological innovations in the design of virtually every western musical instrument over the past three centuries have provided composers and performers with access to previously unheard of expressive possibilities. The piano, in particular has undergone an almost unbroken development from Bartolomeo Cristofori's first workable "soft and loud keyboard" (arpicembalo che fa il piano e il forte) in the early 18th century to the pianos of the contemporary master builder Paolo Fazioli
(Williams, 2002).

Innovations in hammer and pedal action, rapidity of key response, amplitude, pitch range, harmonic resonance, and overall stability have, over the years, provided pianists with an instrument capable of challenging the human voice in its ability to sing and the orchestra in its range of expressive sonorities. Frederic Chopin, Franz Liszt, Charles Alkan, Ferruccio Busoni and Anton Rubenstein were among the 19th century

composer-pianists who explored the uncharted potential of the rapidly evolving instrument to communicate musical experiences that demanded expressive and technical facility beyond anything hitherto imagined. Each in his own way composed, played and taught transcendentally complex works. In its most extreme form a so-called "Grand Manner" of virtuoso pianists emerged—a veritable cult distinguished by their technical audacity, intensity of execution and idiosyncratic interpretations (Hamilton, 2008).

Not surprisingly, the 19th century experienced a flowering of virtuoso composer—pianists distinguished by their individuality as composers and their signature improvisations at the keyboard. Idiosyncrasy was not a critical handicap and mistakes could be shrugged off as a "sign of genius" or nothing more than "uninvited guests"(Anton Rubenstein, cited in Hamilton, 2008, pp. 97-98). The composer-pianist's status as an all-round artist was the name of the game.

The evolving signature voice: improvisation, piano duels and the solo concert

Prior to the late 19th century, a composer-pianist's reputation as a performing artist was built to a large extent on one's skill in improvisation. Whether the event was public or informal the pianist was expected to welcome the audience with an improvised preludio. The work or works that followed were routinely embellished with improvised ornaments, cadenzas and additions to the composed score. Equally significant was the inclusion of pieces composed for the show by the pianist.

It was also normal procedure to improvise mini-compositions based on themes suggested by members of the audience (Hamilton, 2008).

The popularity of the composer-pianists led to the formal introduction of the solo concert by Franz Liszt in 1839. A typical solo concert show-cased new compositions as well as arrangements, improvisations and embellished interpretations of familiar piano and orchestral works. It was an immediate success. Liszt's comment that "Le concert, c'est moi" set the stage for the more familiar solo recital to become the norm by the second half of the 19th century. A recital could last for two to four hours (Hamilton, 2008).

Improvisation duels between celebrated composer/pianists were the ultimate test of one's creative gift. The 19th century duels, notably those of Liszt versus Thalberg (Hamilton, 2008), were updated versions of a long standing tradition that included George Frederick Handel versus Domenico Scarlatti and Wolfang Amadeus Mozart versus Muzio Clementi (Schonberg, H.1962, pp.43-49). A duel could also be a test of the preferred piano of the combatants—a fact not overlooked by piano manufacturers. Mozart, for example, tested his favorite Viennese Stein piano against Muzio Clementi's English Broadwood (Schonberg, 1962).

Neither was improvisation overlooked by the publishers of how-to books on the craft of extemporizing preludios and cadenzas. (Corri,P.A.1813, cited in Hamilton,K.2008 pp.113-116) These publications were designed to show pianists who lacked the creative resources how to compose an improvisation on the spot, let alone with an individual voice. Liszt loved to mimic their efforts at parties (Hamilton, 2008).

Summary and comments

The great composer-pianists saw the untapped resources of the piano as an invitation to explore previously unheard of musical experiences. The works they composed were, by definition, original—so original that their composing signatures are discernable to the present day. Their performing voices were communicated by employing the traditional modes of spontaneously adding to and varying the details of the score. Their ability to do so was tested on stage, in the classroom (Eigeldinger, 1990) and in the occasional duel (Hamilton, 2008).

All things considered, there can be little doubt that the composer-pianists communicated their signature voices by expressively directing and micro-timing their individual conceptions of the music they created. It is highly unlikely that they relied on generalized concepts of technique, timing and expressive cues.

20th century: the rise of specialization

The technical challenges that came with these achievements have continued to occupy the attention of pianists and teachers to the present day (Fraser, A. 2003). Standards of excellence, however, had become so demanding that by the turn of the 20th century that the golden age of composer-pianists gave way to a new breed of specialists (Hamilton, 2008). Leopold Godowsky (1870 –1930) Sergei Rachmaninov (1872 -1942) and Ferruccio Busoni (1866-1924) were among the last of a long line of 19th century composer-pianists.

Once specialization set in, keyboard players who could not master the technical skills were separated from a new breed of super-virtuosi. The transition revived a long-

standing debate about whether the player was a creative artist in her own right, or at best a competent interpreter of the composer's intentions (Taruskin, 1995).

Implications: specialization and the signature voice of a contemporary concert pianist

The point has been made that technological developments and the pianist's signature voice were engaged in a long-standing symbiotic relationship (Haffner, 2008). As a consequence, questions about what constitutes a pianist's signature voice must first consider the expressive possibilities offered by the instrument at hand. The possibilities of the modern piano were first tested by the 19th century composer-pianists. In doing so, they maintained the traditional practice of improvisation as a normal feature in their performances. As a consequence, the composer-pianist's signature voice rested, in part, on what she or he *added* to a notated work. A contemporary concert pianist's signature voice, on the other hand, must identify itself without adding to subtracting from or otherwise embellishing the notated score.

All things considered, the legacy of the golden age of pianism is a masterful repertoire of works written for solo piano and concerto by great composer-pianists. The legacy continues to make up the bulk of the standard repertoire. The skills demanded by the repertoire have continued to occupy the attention of pianists, teachers, theorists and builders to the present day (Carhart, 2001; Fraser, 2003). An elusive piano voice has become the measure of excellence for both the instrument and those who aspire to master it.

Defining a contemporary pianist's signature voice

Defining a contemporary concert pianist's signature voice poses challenges for the pianist as well as the researcher. A concert pianist today is, for the most part, a specialist. As a specialist she is not expected to demonstrate her skills in improvisation, embellishment and signature arrangements of the score. Neither is it necessary for her to be a composer. What is required is that her performances, however varied, consistently identify themselves with her signature voice without materially altering the composed score (Cohen, 2008). The paradox is self-evident (Barenboim & Said, 2002).

The pianist's singing voice: describing its elusive qualities

The cues to describing a pianist's singing tone can be elusive even to a seasoned analyst. A singing tone depends on the nuanced variations in tone quality that are normally considered a measure of the player's mastery of touch (Repp, 1999). The challenge comes with how "to transform the piano from a percussive instrument into a singing voice" (Vladimir Horowitz cited in Frost, 2003, p.11) A pianist can, for example, gently tap, slap and slide forward and back on a key or from one key to the next. She can bounce off the keys, depress them in graduated degrees from the surface to the key bed and back. She can release the sounds less than half or all the way up. She can sustain the sounds while overlapping them with adjacent or distant keys. A five-note chord can be sustained while allowing two or three notes to rise in graduated degrees. She can release them abruptly one after the other. Every movement requires an ear that is focused on minutely detailed qualities of touch, that is, on expressive relationships that are felt in the fingers and produced with micro-timed precision. When the pianist adds pedaling to

tactile sensation she releases harmonic resonances that can simulate qualities of sound, such as vibrato, that would not otherwise be possible. She can depress the damper pedal, lift it partially, gradually or suddenly. She can hold it at any level of depth to synchronize the resonance at strategic points in the musical flow. She can simultaneously micro-time it by foot with the *una corda* (soft) pedal or the *sostenuto* pedal that sustains a single note. She can enter on the beat, off the beat or between the beats. Like the fingers, the pedals can be expressively directed and micro-timed to nuance a singing line at every available degree of duration and amplitude.

In attempting to describe his own legendary singing tone, Artur Rubinstein could carry it no further than the following explanation. After mentioning how the beautiful tone of a singer's voice brought tears to his eyes, he realized that it was "not the melody or the composition but the quality of her voice that affected me. It struck Rubinstein that he should explore ways of "breathing" his phrases into the piano keys: "I sometimes press my fingers on it (the piano key) … that (technically speaking) " means nothing" (because)… "it is a hammer … of a percussion instrument. … but it plays the vibration (that is, the harmonic resonance). You let the string stay, without letting the hammer down, it vibrates in the air and you … keep it (vibrating) as long as you can with a certain pressure that makes the sound happen in a certain way" (the way you hear it). Rubenstein concludes that "I learned it myself but I couldn't ever teach it"
(Televised interview, 1977, "Rubinstein at 90").

Summary comments

With 88 keys and 3 pedals to play with, the singing options provided by a modern concert grand would seem to be inexhaustible. Yet, a singing line can be elusive when it is visually represented on any available means of computer based analysis. It is elusive yet experienced, capable of being described yet difficult to represent (Kochevitsky, 1967).

Some performers seem able to communicate these subtleties on just about any available keyboard (Haffner, 2008). Others, notably Glenn Gould (Haffner, 2008) and Vladimir Horowitz (Mach, 1991) seemed to need a piano that responded to their touch as if it was an extension of their musical voices.

Voice leading

More accessible to representational analysis is voice leading. Voice leadings are the choices a pianist makes when varying the timing and expressive emphasis between the soprano, alto, tenor and bass voices of the piano (Rosen, 1999). A variant can be as deceptively simple as shifting the emphasis from the soprano to the tenor or alto voice or altering the dynamics of a repeated phrase from a crescendo to a diminuendo (Eigeldinger, 1990).

Voice leading can also be shown when, for example, a pianist is precisely timing the synchronization of a single voice in three-four time over a steady beat in four-four time. Chopin dubbed the left hand as “the conductor” when he felt it was necessary to maintain a steady beat (Eigeldinger, 1990; Rosen, 1999).

Most important in the present context is to show how voice leading, in one form or another, will provide information that can be accurately represented on available graphs. This point was a main consideration in the comparative performance analyses of

Vladimir Horowitz's creatively varied voice leadings. The essential features of these voice leadings are discussed below.

Comparative signature analyses—consistency and creative variability

The aim of the comparative signature voice analyses was to identify the specific characteristics of Vladimir Horowitz's signature voice that distinguish it from others in the field. The analyses were conducted by means of spectrographic and amplitude timeline graphs in the following contexts:

1) Consistency: Horowitz's expressively directed focus on one or more specific tonal relationships over time as represented in a variety of voice leadings. Consistency is confirmed in repeated performances of a diverse number of works regardless of their contexts or who composed them.

2) Creative variability: Horowitz's expressively directed micro–timing of nuanced tonal relationships that are creatively varied in repeated performances of a single work over time.

By examining *consistency* and *creative variability*, as defined above, it will be possible to have at hand a viable means for identifying the features specific to the signature voice of any one highly accomplished pianist. The discussion below considers a number of important qualifying aspects necessary to stamping a seal of authenticity to the consistent and creatively varied features of a pianist's signature voice.

These qualifiers begin with the point that a contemporary pianist's creatively varied signature voice is distinguished from a rehearsed interpretation *of the work as a whole*, an edited version prepared in advance for recording purposes, an improvised

embellishment or a notated arrangement of the original score. The latter two were common to historical practice in music performance prior to the advent of recordings. Rehearsed interpretations, on the other hand, and edited recordings are more the norm in contemporary performance practice. In this regard, Glenn Gould distinguishes editing that corrects mistakes from a creatively oriented version that aims at composing "a completely new" realization of the music (Friedrich, 2000 p.135). As such, the latter becomes a singular work of art signed by the artist, documented in sound and fixed in time.

Gould notwithstanding, a signature voice can be assumed in any one or all of the above. None of these, however, indicates an ability to spontaneously vary a notated score in its entirety between successive performances of the same work. This distinction is important because creatively varied performances are signed, sealed and delivered without apparent reflection while the artist is in direct contact with his or her live or studio audience.

The underlying premise is, accordingly, that a pianist's signature voice is embedded in the consistency of the creatively varied experiences he or she composes on the spot.

Reflections by great pianists on the art of creating their signature performances

Equal status for composer and pianist brings up questions about what identifies the performance of a virtuoso pianist as a creative act that is comparable to a notated composition. To Franz Liszt the art of the virtuoso pianist rests on the ability to bring one's consciousness to bear upon the score from a perspective shaped by skill and passion: it was largely a matter of making the "music speak, weep, sing and sigh." In

Liszt's view the true virtuoso can be considered a creator in his own right when he shares these faculties with the composer (cited in Frost, 2001,p.9).

To Frederic Chopin, creativity resided in the ability to vary the notated details from one performance to the next. "I seldom play," he said, "a thing twice in the same way." He emphasized the point by encouraging his students to add something "of their own to the interpretation" rather than attempt to copy one of his performances (cited in Eigeldinger, 1990, p. 55).

Chopin, it would appear, opted for a distinctive personal voice in successive performances of a work as a measure of a player's creative imagination. He did not, however, say what enters into a performing artist's personal voice that makes it equivalent to that of a composed piece of music.

Vladimir Horowitz picked up on this last point by asserting the importance of having "a very clear"… "conception of the spirit of the music"… essentially a framework that frees one to "leave smaller details to the spur of the moment (cited in Frost, 2001, p. 9). Horowitz doesn't elaborate on the nature of these "smaller details" or whether they are sufficient in themselves to identify the resulting variations on a given text as works of art stamped with the artist's unmistakable signature. Neither does he speculate on what details a particular artist might choose to emphasize and, most critically, how he or she might time and vary these details in successive performances of the same work.

Liszt, Chopin and Horowitz attempt to describe what each considers essential before a performer can spontaneously shape a meaningful creative experience. They do not, however, consider the resources a highly accomplished artist might draw upon to imprint his or her particular signature on the creative act. What, for example, does one

mean by a signature performance? What makes it a work of art? What characteristics does it share, if any, with one's written signature, manner of walking, gestures or tone of voice?

On the latter point, the signature of a highly accomplished performing artist can perhaps be described as a construct drawn from the individual's stage persona (Anne Sophie Otter (Gramaphone, 2007). From this perspective, it could just as easily be called a persona signature because it is a cultivated, larger than life presence that is *necessarily distinct* from the everyday personal and social mannerisms that identify one in the social arena. The stage persona speaks for the artist but tells little about the person.

All things considered, the raison d'être of virtually every great artist in every discipline is the overriding need to cultivate one's personal voice to the fullest. For the mature performing artist fulfillment is summarized with a signature voice stamped by a life long journey of experiment, refinement and commitment (Grotowski, 1968; McCallum, 2003). These qualities are reflected in the biographies, interviews and reflections of great performers in the final years of their lives.

Artur Rubinstein's commitment to his raison d'etre is affirmed in a poignant recollection at age 90 of his love affair with his audience. Rubenstein was asked in a televised interview how he and his audience managed to connect so well throughout his career. He replied by referring to "a certain antenna, a secret thing that emanates from me … it projects something I feel … it puts the audience in my hand … I feel them all here (in his hand) … I can hold them with one little note in the air and they will not breath because … they wait (and wonder) … what will come next in the music ? …. It is a great, great moment. …when it happens, it is a great moment in our (mutual) lives". Rubinstein

concluded by describing the feeling as a "sensual pleasure" that emanates from his touch. "I may, he explained, "hear a Chopin Nocturne as a love song and become excited when I touch, say, a b flat that gives me the sound I need to hear"
(Televised interview, 1977,"Rubinstein at 90").

Summary comments

The above discussion has reviewed issues specific to identifying a contemporary concert pianist's signature voice. These range from the elimination of improvised additions to the given score to the difficulties involved in visually representing the subtler details of touch, tone and pedaling that identify a pianist's singing voice. Voice leadings in the latter case were discussed as a viable alternative that can be visually represented for comparative signature analysis, particularly within a consistency/creative variability mode of analysis. The reflections by great pianists on their art and Artur Rubinstein on his raison d'être completed the sequence.

Here, the discussion will turn to why Vladimir Horowitz has been chosen as the ideal candidate for an in-depth comparative signature voice analysis.

Why Vladimir Horowitz?

Vladimir Horowitz's live and studio recordings cover over sixty years (1928-1989) and are perhaps the most thoroughly documented career of a performing artist of the 20th century. His uncanny ability to create outstanding musical experiences echo Franz Liszt's dictum that music becomes real when it can " speak, weep, sing and sigh" and Frederic Chopin's "I seldom play a piece twice in the same way". The mystique is

supported by a substantial body of recorded audio and film interviews with his colleagues, students, critics, and the media as well as verbatim discussions with Horowitz and his wife, friends and associates (Plaskin, 1983). These include Horowitz's personal reflections on his art—why, for example, he found it necessary to refresh his skills by taking a break on three occasions from public performances (Dubal, 1991; Frost 2003; Mach,1988; Plaskin,1983).

Horowitz's playing techniques have been examined by teacher-pianists, notably Alan Fraser, over the years. Fraser, for example, has commented on the uniqueness of Horowitz's varied hand and seating positions and original foot position in his pedalings. He cautions students not assume that sitting the way Horowitz sits at piano means they will automatically play like Horowitz. (Fraser, 2003, pp. 289- 293). On the documented and filmed evidence of Horowitz's off stage (Dubal, 2004) as well his on stage "eccentricities"(Repp, 1992) one could add that he most likely re-arranged these and related body positioning from one performance to the next over time before settling on an all round acceptable position in his final years. This suggests that, like many highly accomplished artists, Horowitz was experimenting with a variety of alternative means for organizing his creative resources to the their fullest. If this was so, his experiments set the stage for the complete expression of his signature voice over time and circumstance.

Most significant, in the present context, are the features that identify Horowitz's signature voice from his earliest stage performances to his mature years as one of the greatest pianists of the past century—how, for example, he employed voice leadings that challenge traditional historical and stylistic performance practices. These consistently show a predilection for unique inner voice relationships, singing tones and harmonic

colorings. The effectiveness of these departures from normal practice becomes evident when one compares his voice leading in works by composers as stylistically diverse as Haydn in the 18th Century, Chopin, Schumann, and Tchaikovsky in the 19th Century and Scriabin and Rachmaninov in the 20th Century.

An added advantage for comparative signature analysis is the relatively large number of familiar works that Horowitz repeated in successive recordings over the years. In addition, Horowitz's recordings contain unedited studio as well as live performances. According to his producer, Thomas Frost, Horowitz considered studio personnel a "friendly" audience. He would, accordingly, ignore the error and repeat the entire work or movement as a whole. It was Horowitz's way of sharing the spontaneity he considered fundamental to music making.

Horowitz speaks for his signature

"The most important thing is to transform the piano from a percussive instrument into a singing instrument….a singing instrument is made up of shadows and color(s) and contrasts. The secret lies mainly in the contrasts. … One must (first) have a clear conception of the spirit of the music and its larger framework. The Germans call it (an)Auffussung. When you have that (the conception) you can leave (the) smaller details to the spur of the moment. I know the color of each section but the exact shade is better left to inspiration" (cited by Frost. 2003, pp. 12-13).

Why voice leading?

It is appropriate here to expand upon the previous discussion of the elusively timed qualities of touch and pedaling that enter into the identification of a major pianist's singing voice. The colors and contrasts of a pianist's singing voice are nuances that challenge analysis even when they are directly experienced. This is understandable when one considers that the act of touch on a piano is responsible for the sound that distinguishes one's individual voice (Kochevitsky, 1967). Most ambiguous are the attempts to describe a pianist's characteristic sound in terms of touch qualities that emulate declamations borrowed from the vocal repertoire: typically *parlando* inspired by speech/song in opera recitatives and the occasional aria and *portamento*—overlapping tones (Ward, 1973).

Equally intangible is pedaling. Pedaling is an art so elusive that Ravel and Debussy, among other composers, rarely notated it on the grounds that every player would interpret it differently (Korman, 1996). In his recorded performance of Debussy's Engulfed Cathedral, Krystian Zimerman carried the elusive qualities of pedaling a step further. He micro-timed his pedaling and touch to create a slight rise in pitch at a critical juncture between two keys (measure 46)—essentially transcending the apparent limits of the instrument (Zimerman, 1994).

Visual representations to date are not equipped to compare some of the finer details that distinguish the singing voice of Vladimir Horowitz from Martha Argerich, Artur Rubinstein or Shura Cherkassky. This is because the production of a singing tone involves distinctions that range from subtly graded degrees of key touch and foot pressure from the surface through to the bottom of both playing mechanisms. On the

other hand, the what, where, when and how a pianist times her voice leadings can be represented by timeline and spectrographic analyses because expressively directed micro-timings can be measured with millisecond precision and compared over most voice leading durations amplitudes and harmonic resonances.

As a result, the decision was made to employ voice leadings for comparative signature analyses that are specific to each work across the repertoire. Voice leadings are identifiable characteristics of Horowitz's signature performances. His command of a seemingly infinite number of colorings in voice leadings allowed him to make the specific choices that identify his performances, whatever the context may be. Horowitz would typically shift the melodic emphasis back and forth from the soprano voice to the alto, tenor, and or bass voices. He achieved this by combining the durations and amplitudes of his voicing with micro-timed degrees of pedaled harmonic resonance that simulate a singer's breath rhythms and vibrato.

In summary, a colleague speaks for Horowitz's voice

The celebrated pianist John Browning considered Horowitz's sound "beyond technique" because " he could play ten different voices and make them sound like ten different instruments." It was beyond technique because one could hear the Horowitzian sound whether or not he was using the pedal. The differences were in his poetic inflections (cited in Mach,1988 pp. 38, 40). For Browning it was "all in the sound" -the sound of Horowitz the poet.

The comparative signature analyses follow next in Chapter 5. The first work to be compared is Robert Schumann's Träumerei (Figure 4.1 below). Twelve performances of the work will be compared. Eight are by Vladimir Horowitz.

When one follows the score of Träumerei one can see how the timing of every note and metrical relationship is precisely notated. The metronome times the entire work at a 100 mm. to the quarter note beat. A *ritard* completes bar eight, another ritard at bar 16, and a final *ritenuto* (gradual ritard) and fermata at bar 22 twenty-two completes the piece at bar 24. A *piano* (softly) under the first note is the only expressive indication. It is all clearly spelled out.

As a prelude to the comparative signature analyses, one can visualize an imaginary builder who has designed a mechanical piano that can upstage all the pianists in the study. His piano is precisely timed to avoid the speaking, singing, weeping and sighing that pianists, according to the builder, dig up to pass themselves off as every bit as creative as the composer. And it can repeat the performance over and over all by itself in exactly the same way for all eternity.

The score in Chapter 5 is an exact copy of the one below. Now visualize the uniqueness of the experience when a piano minus a pianist upstages Vladimir Horowitz, Lang Lang, Martha Argerich and Alfred Cortot.

Träumerei—a musician's dream

Träumerei is a reverie in multiple voices. The voices can be heard as engaged in a person-to-person dialogue, reminiscence, a lullaby, or a tender farewell. Träumerei was Vladimir Horowitz's signature encore during the final twenty years of his career. The

comparative signature analyses in Chapter 5 consist of eight of his recorded performances of Träumerei during this period. Seven of the performances are live (1965-1987) and one is a studio recording (1962).

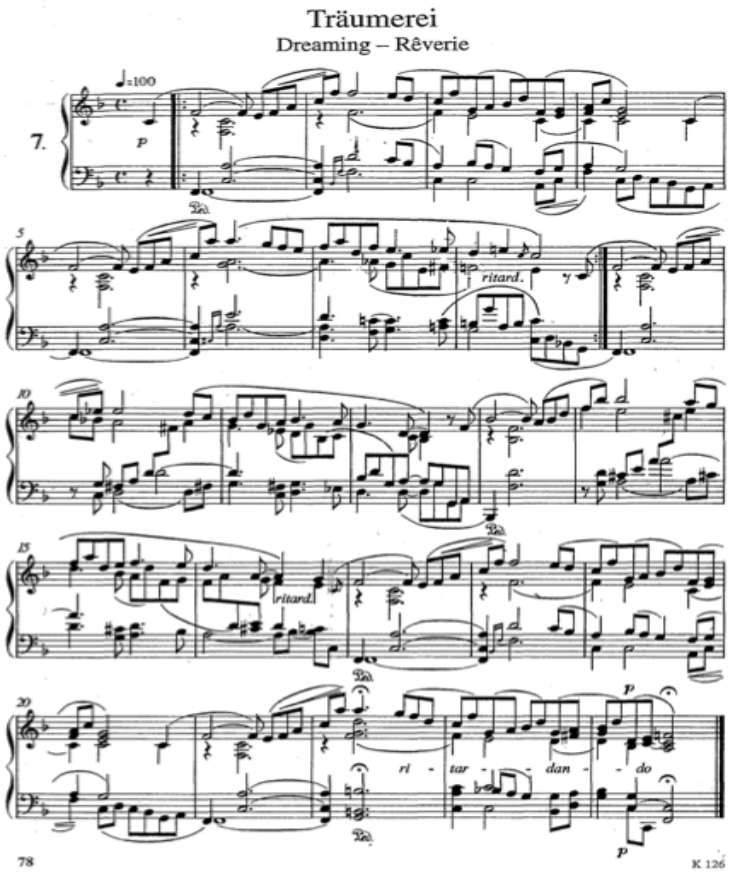


Figure 4.1.Robert Schumann Träumerei from Kinderszenen

CHAPTER 5

VLADIMIR HOROWITZ:

COMPARATIVE PERFORMANCE ANALYSES OF HIS SIGNATURE VOICE—CONSISTENT AND CREATIVELY VARIED FEATURES

"It don't mean a thing

if it ain't got that swing"

(Louis Armstrong)

Vladimir Horowitz made music that meant many things to many people. He could swing it with a beat that nobody could beat. A beat all his own. They loved it.

This chapter will focus on the comparative performance analyses of the consistent and creatively varied features of Vladimir Horowitz's signature voice. The recordings by Horowitz selected for comparative analyses cover a period of close to sixty years (1928-1987). (When performances recorded by the other pianists in the study are considered the time frame extends to eighty-eight years, from 1921-2009). The sixty-year period encompassed is one of the most lengthy and thoroughly documented careers of a celebrated performing artist in the 20th century. Horowitz's legacy has, as a consequence, provided the study with a comprehensive body of commercial and archival recordings for comparative analyses. These recordings have made it possible to select performances that were for the most part recorded live and on stage (Table 5.1).

Horowitz: performances analyzed	Date/Place	Live/Studio
Bizet-Horowitz Variations On Themes From Carmen	1928 New Jersey	Studio
Chopin Piano Sonata No.2 In B Flat minor op.35,III Marche Funèbre	1950 New York	Studio
Chopin Piano Sonata No.2 In B Flat minor op.35,III Marche Funèbre	1962 New York	Studio
Chopin Piano Sonata No.2 In B Flat minor op.35,III Marche Funèbre	1978 White House	Live
Haydn Piano Sonata in E-Flat major Hob.XVI/49,II Adagio e cantabile	1989 New York	Studio
Haydn Piano Sonata in E-Flat major Hob.XVI/49,III Finale:Tempo di Minuet	1989 New York	Studio
Horowitz Danse Excentrique	1930 New York	Live
Rachmaninov Polka de W.R.	1986 New York	Live
Rachmaninov Polka de W.R.	1986 Moscow	Live
Rachmaninov Polka de W.R.	1986 Leningrad	Live
Rachmaninov Prelude No.12, op. 32	1968 Carnegie Hall	Live
Rachmaninov Prelude No.12, op. 32	1986 Carnegie Hall	Live
Rachmaninov Prelude No.12, op. 32	1986 Moscow	Live
Rachmaninov Prelude No.12, op. 32	1986 Leningrad	Live
Rachmaninov Prelude No.12, op. 32	1986 Berlin	Live
Schumann Träumerei from Kinderszenen op. 15	1962 New York	Studio
Schumann Träumerei from Kinderszenen op. 15	1965 Carnegie Hall	Live
Schumann Träumerei from Kinderszenen op. 15	1968 Carnegie Hall	Live
Schumann Träumerei from Kinderszenen op. 15	1986 Moscow	Live
Schumann Träumerei from Kinderszenen op. 15	1986 Leningrad	Live
Schumann Träumerei from Kinderszenen op. 15	1987 Vienna	Live
Schumann Träumerei from Kinderszenen op. 15	1987 Hamburg	Live
Schumann Träumerei from Kinderszenen op. 15	1986 Berlin	Live
Scriabin Étude op. 2 no. 1	1963 New York	Studio
Scriabin Étude op. 2 no. 1	1965 Carnegie Hall	Live
Scriabin Étude op. 2 no. 1	1986 Moscow	Live
Scriabin Étude op. 2 no. 1	1986 Berlin	Live
Tchaikovsky Piano Concerto No1. I Allegro non troppo et molto maestoso	1941 Carnegie Hall	Live
Tchaikovsky Piano Concerto No1. I. Allegro non troppo et molto maestoso	1953 New York	Live

Table 5.1 Recorded performances of Vladimir Horowitz: Titles in italics were retained for comparative analyses. The remainder are stored in the database for analytical reference.

Contexts employed for analyses

The comparative performance analyses consist of six studies. Each study involves a single work that is comparatively analyzed in the following contexts: a) Horowitz's repeated performances of the work over time and circumstance, and b) the comparative analyses of his performances with one or more pianists in the study. The overall timings of these works range from durations of approximately two to ten minutes. Excerpts selected for comparison range from four to 25 seconds. These relatively brief timings allow the analyst to focus on specific micro-timed details without losing a sense of the whole. The primary consideration throughout the analytical process is on the choices Horowitz made between specific voicing(s), their consistency and their creatively varied micro timing in successive performances. These details are analyzed by means of the Amadeus II Amplitude time-line and Spectrographic modalities.

The analytical process: Reading the Amplitude timeline and Spectrographic representations

The discussion below points out what one looks for when reading the visual representations of the Amplitude timeline and Spectrographic modalities and when reading the markers that have been added to the representations. These markers show the location of note-to-note entrances, their timings, functions, groupings and overall durations for measurement and comparative performance analyses (Legend - Figure 5.1 and Figure 5.2). Identifying markers have also been added to spectrographic representations of the acoustic properties of the piano that enter into high level performance (Figure 5.3/a and 5.3/b).

Amplitude timeline: intensities and durations

Note-to-note amplitude intensities are visually represented by degrees in the thickness and spikes of the black horizontal lines. note-to-note and group durations are identified by means of added vertical markers. The markers encompass the precise timings of note-to-note entrances. The color code identifies the representation of specific functions .

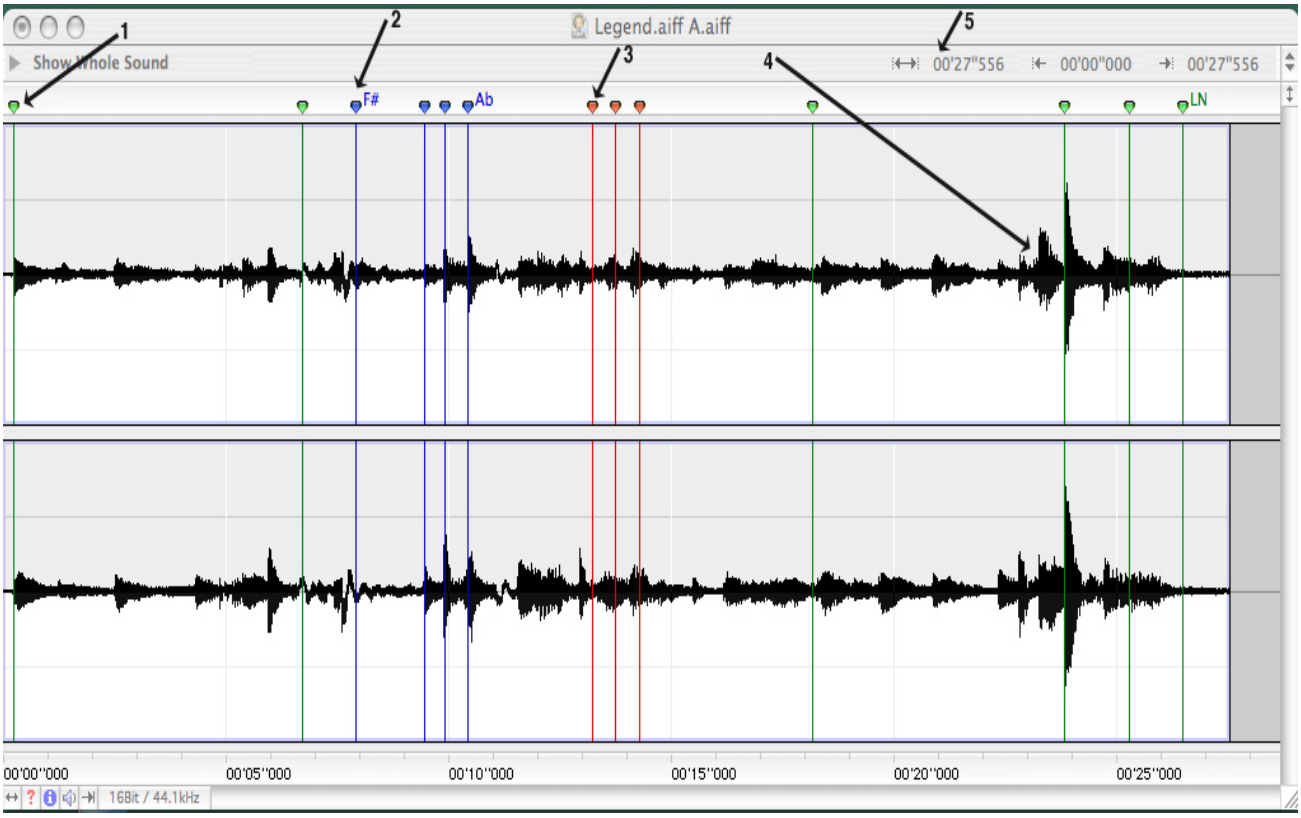


Figure 5.1. Amplitude Timeline Graph**.**

Legend:
1 - Green markers represent structural points of the piece to show timing variability:
2 - Blue markers represent entrances with an emphasis on inner voices (b –flat, #-sharp, x- double sharp.)
3 - Red markers represent entrances with an emphasis on the soprano (up most) voic.
4 - Instantaneous variations of amplitude
5 - Overall duration of the excerpt in 00’ 27” 556 (minutes, seconds, milliseconds)

Spectrograms

The spectrographic colors visually represent all instrumental harmonic intensities, surrounding resonances and environmental noises. These range from the blue harmonic intensities to the yellow, orange and faded green of the auxiliary soundscape and the black of complete silence. The precise note-to-note entrances, attacks, harmonic intensities and decays are shown in the breadth, shape and length of the blue representations. Added markers point to notes that are specific to the analytical process at hand.

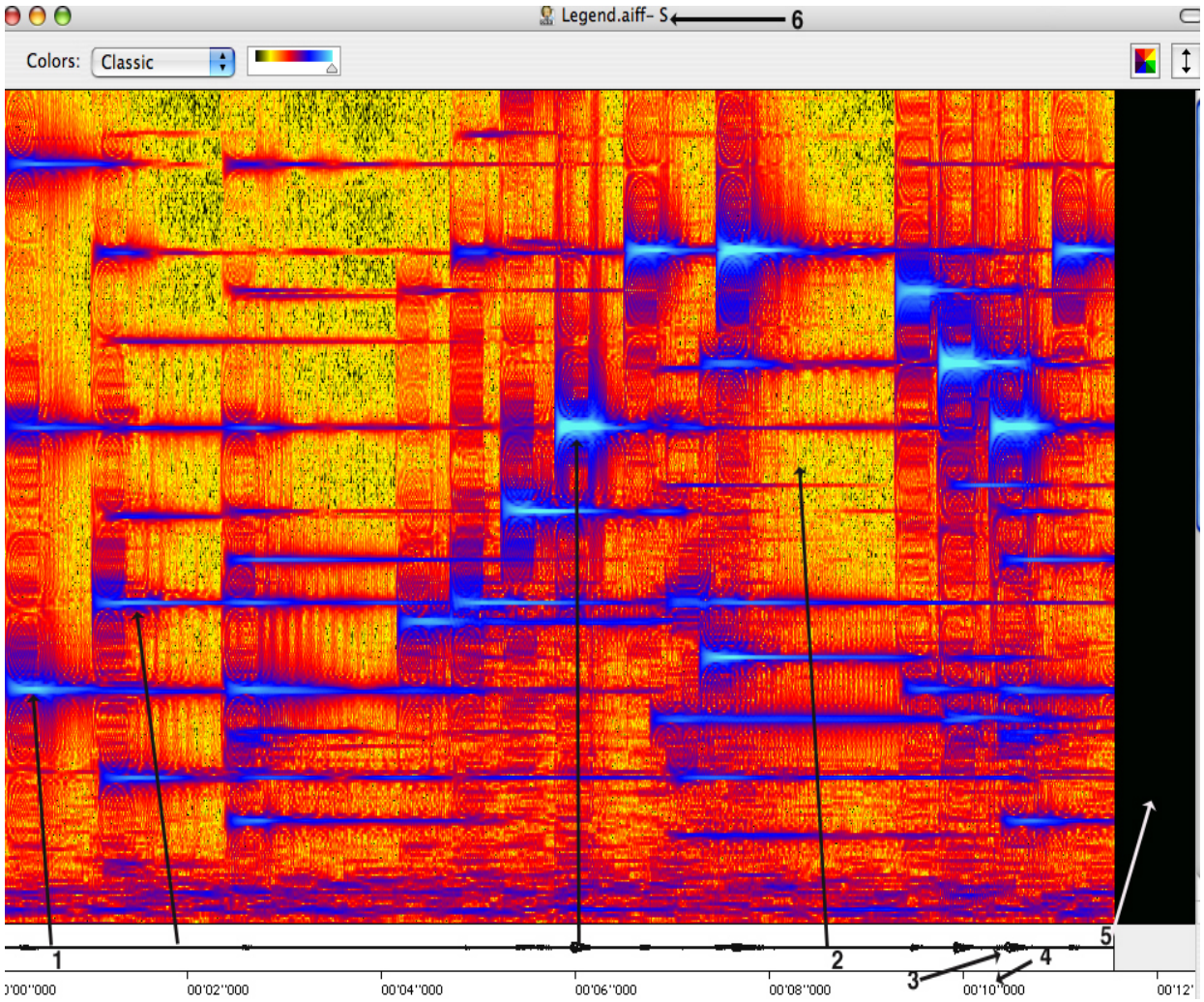


Figure 5.2. Example of a spectrogram.

Legend:
1- Emphasis and duration of a note-to-note attack and its harmonic relationships.
2- Background reverberation and/or background noise.
3- Amplitude timeline.
4- Timing indications of the excerpt in (min.s.ms.).
5- Silence (no sound)
6- Audio Excerpt file Name

Harmonic resonance and the concert grand piano: the visual intensity paradox

Figures 5.3/a and 5.3/b illustrate a paradox specific to harmonic resonance: namely, the conditions under which a resonating tone will be represented visually as louder (more intense) than it will be heard.

Figure 5.3/a. The black arrow points to the lowest C (blue) on the piano keyboard. The note had been struck once. The arrows that follow point to the sequencing of every resonating C (blue) that follows at each octave over the entire piano keyboard. The blue color, shape and size show a higher degree of intensity than the initial tone. The significant point here is that not one of these resonating tones was played on the instrument.

Figure 5. 3/b. In this example a performance of a chromatic scale is represented over the entire keyboard range. The lowest white arrow points to the fundamental tone. The white arrows that follow point to the first three resonating harmonics in the upward sequence.

The significance of this is the following. Both examples illustrate the resonating capabilities of a concert grand piano. What they do not show is how the harmonic richness of the instrument offers unique creative possibilities for exploration by a highly accomplished pianist. The pianist, for example, might manipulate these unplayed resonating properties to emphasize specific harmonic and melodic relationships that would not otherwise be possible to identify. Horowitz's masterful command of harmonic resonance is discussed in the comparatively analyzed contexts that follow.

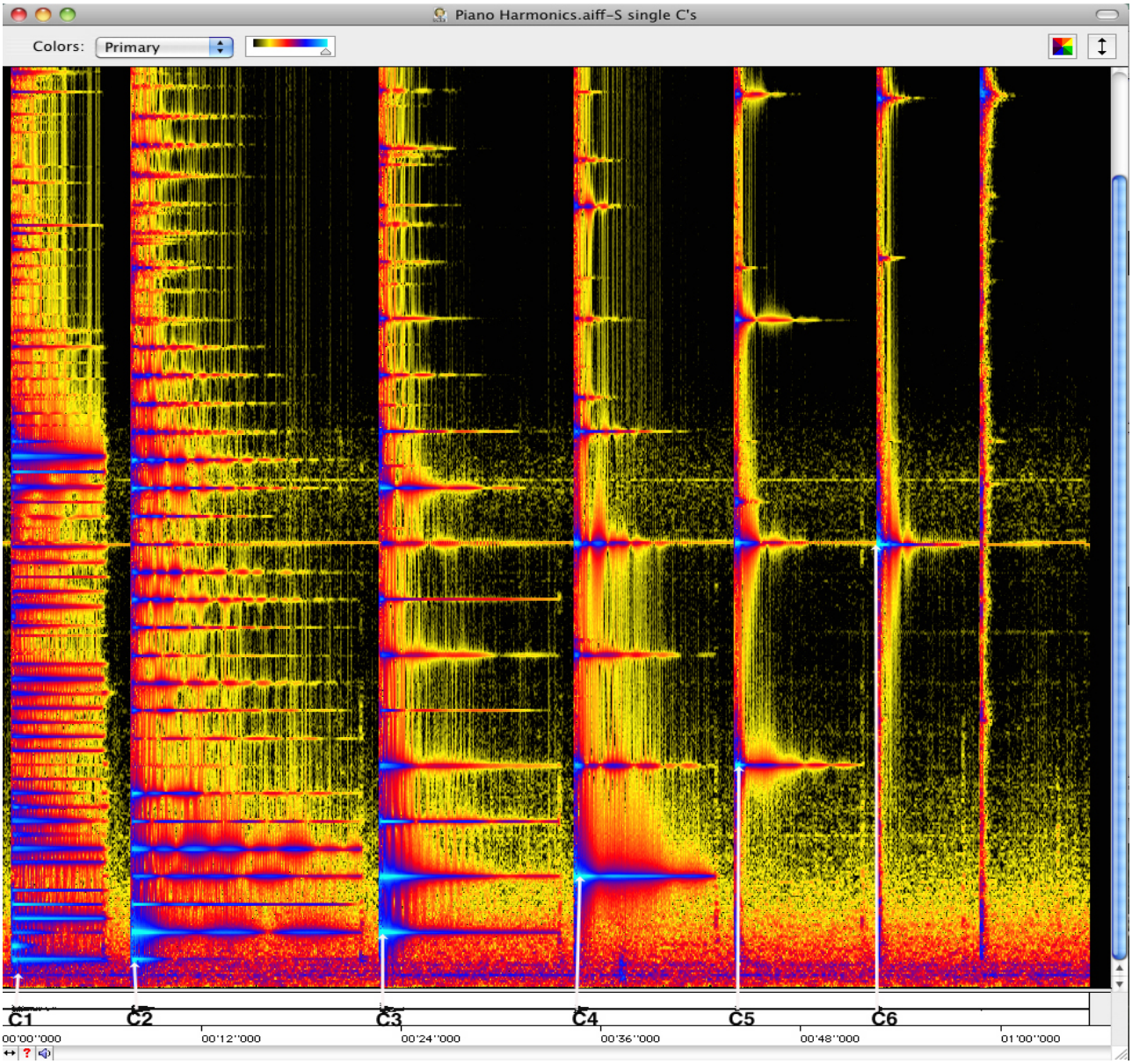


Figure 5.3/a. **Spectrogram**. Example of *harmonics* from lowest to highest C's recorded on the Yamaha Concert Grand piano at OPCH.

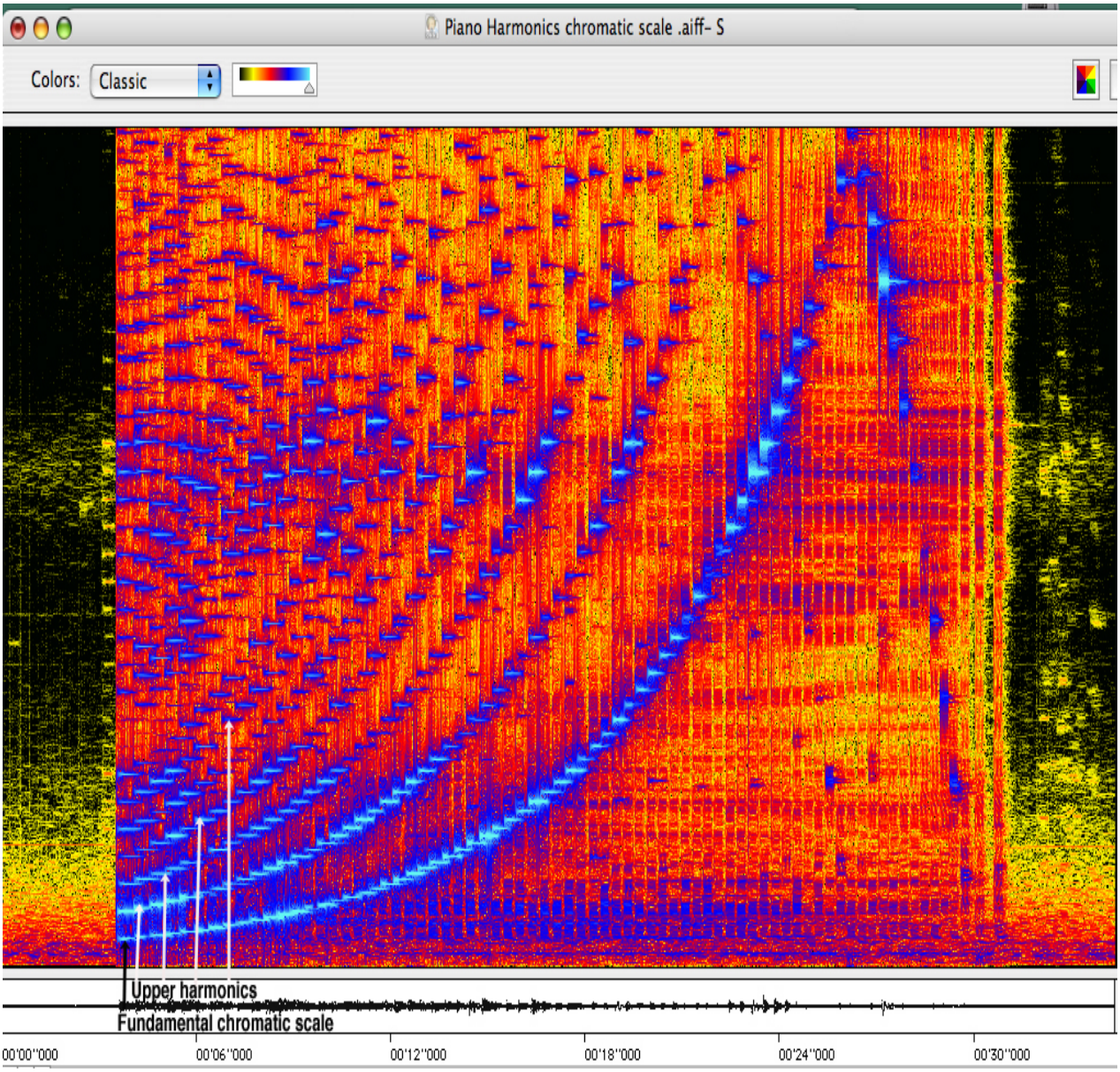


Figure 5.3/b. **Spectrogram**. Example of chromatic scale and its upper harmonics performed on the Yamaha Concert Grand piano at OPCH Concordia University (recorded September 2010).

Comparative analyses

The following compositions are analyzed in the order shown:

Robert Schumann, *Traumerei, op. 15*

Frederic Chopin, *Funeral March*, *Sonata in b flat minor, op. 35.*

Sergei Rachmaninov, *Prelude op. 32 no. 12 in g# minor*.

Sergei Rachmaninov. *Polka de W.R.*

Alexander Scriabin*, Etude in c# minor, op. 2 no. 1.*

Josef Haydn*, Sonata in E flat major Hob.XVI 49 II, Adagio e Cantabile.*

Introductory Remarks: Consistency and creative variability of voicing relationships

The analytical process is introduced here with a discussion in general terms of a) the consistent features of Vladimir Horowitz's voicing, and b) their creative variability in terms of expressively directed micro-timing. The features displaying consistency and creative variability include the following:

(1) Inner voice predominance: Horowitz consistently changed inner voice leadings from their accompanying roles to a primary role as the governing melodic line.

(2) Conversational voicings: Horowitz often shifted back and forth from a soprano to a tenor and or alto or bass voice. He expressively directed and micro timed these alternating sequences to suggest a conversation between voices that was rarely notated as such in the score.

(3) Bar line overlapping: Horowitz's voice leadings routinely crossed bar line divisions. This allowed him to creatively vary the durations, articulations and focal emphases between succeeding phrases.

(4) Upbeat stress and pulling of the beat: Horowitz frequently altered the perception of an entire sequence of phrases by lengthening selected upbeats in a given voice line and shortening the following downbeats. The result was a distinctive syncopated pulling of the beat between voices.

(5) Element of surprise: Horowitz often brought an unexpected perspective to a work as a whole by micro-timing a sudden shift of direction at a crucial juncture in the musical line.

(6) The re-shaping of ornamental phrases: Horowitz often treats ornaments as a melodic line.

With the above in mind the comparative analyses of Vladimir Horowitz's repeated performances of Robert Schumann's Träumerei will open the discussion of the identifying features of his performing signature.

Robert Schumann, *Träumerei,* Scenes from Childhood, op.15.

Horowitz (1962-1987): Comparative analyses of eight of Horowitz's recorded performances of Träumerei. Seven of the performances were recorded live and one (New York, 1962) is a studio recording.

Amplitude timeline representations. (Figures 5.4, 5.5, 5.6)

Horowitz's eight performances of *Träumerei* are introduced below with a brief overview of their consistent and creatively varied features as represented in the amplitude timelines. The timelines show two contrasting features of Horowitz's repeated performances of *Träumerei*. The first is the relative consistency (indicated by the red arrow markers in the figures) between the overall durations of these performances (see

Table 5.2 for the durations). Most notable are the virtually identical overall durations of the 1965 Carnegie Hall(02'34" 939) and 1987 Vienna (02' 34''334) performances, despite the twenty-two year period that separated them.

On the other hand, Horowitz's timings of his note-to-note entrances and phrase groupings are consistently varied from one performance to the next (Table 5.2). One may compare, for example how he varies the timing of his inner voice entrances, groupings and spacings (shown with blue markers) in his Moscow, Leningrad and Hamburg performances (Figure 5.4), or the micro-timed differences between all eight representations (shown with green markers) of the entrances to arpeggios, the Principal Theme, the Development Section and Coda.

Equally varied are the distinctions between amplitude densities and their timings in Horowitz's repeated performances of *Träumerei.* Compare, for example the New York (1962), Carnegie (1965), and Berlin (1986) recordings. The amplitude representations not only differ in their note-to-note intensities, but also in their entrance timings, groupings and spacings. (Note: The accuracy of a recording of amplitude intensities will be determined in part by the acoustical properties of the piano as well as the surrounding environment (as discussed in Chapter 4).

The number of inner voice entrances, groupings and spacings that are indicated by the blue markers are seen in the representations of every one of Horowitz's eight performances. The comparative analyses will show why, for example, the predominance of these inner voice leadings is a vital key to Horowitz's performing signature. It will show as well how they are simultaneously consistent yet creatively varied (Figures 5.4, 5.5, 5.6).

The discussions that follow will consider how every one of Horowitz's characterizations of *Träumerei* was determined by his emphasis on the specific details that he micro timed to distinguish the performance at hand from the others. These subtly timed distinctions account for the contrasting moods that he created out of Traumerei: moods that ranged from the playfulness of his Berlin recording to the dreamlike reveries of his New York and Moscow performances.

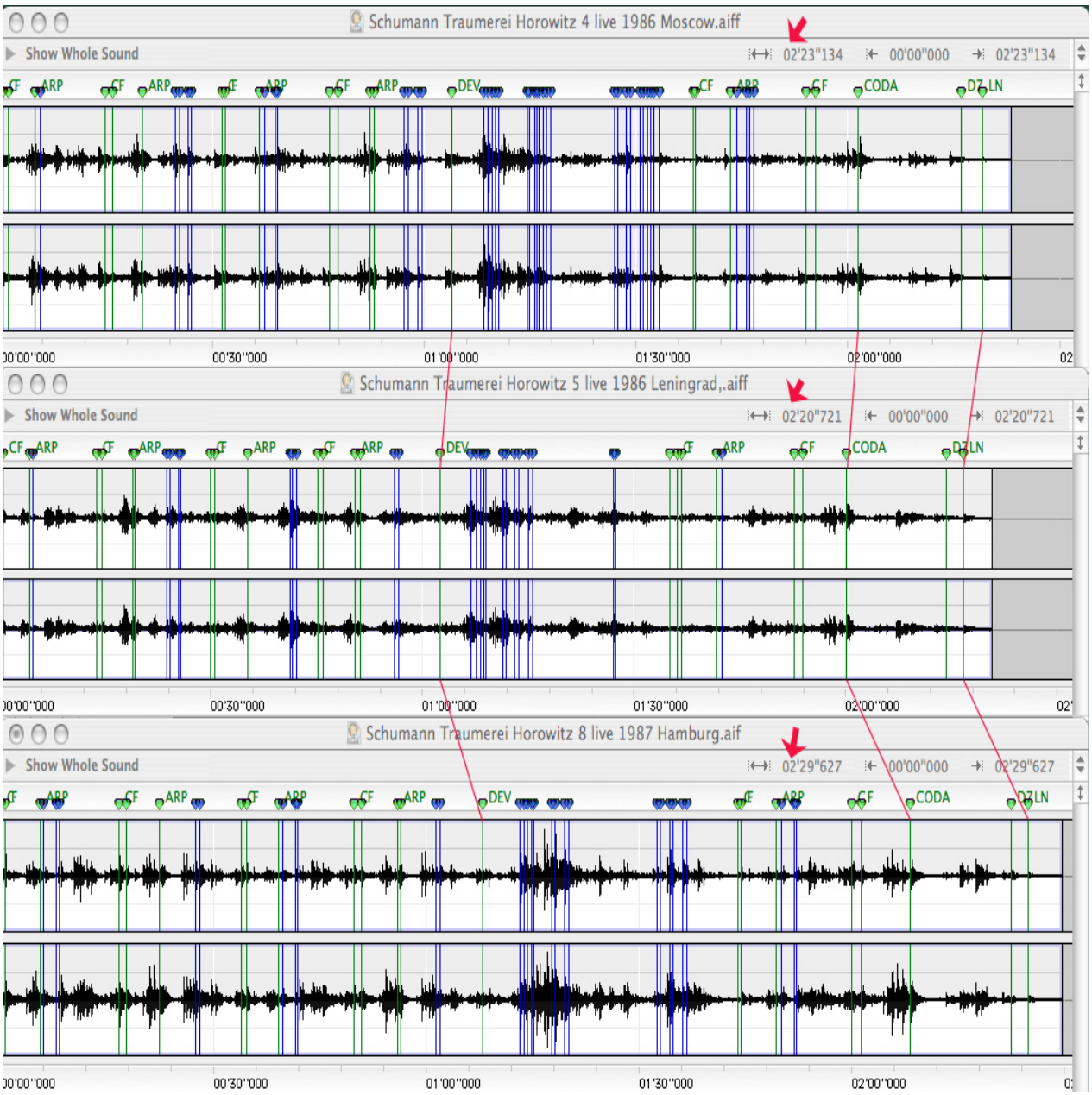


Figure 5.4. Amplitude Timeline of three performances by Vladimir Horowitz of Robert Schumann's *Träumerei*. **Green Markers**: CF-opening notes of Principal Theme (PT), ARP-*arpeggio* – broken chord, DEV-development section, D7- (dominant seventh) harmonic tension at the ending of composition (cadence). LN – last note entrance and harmonic resolution. **Blue Markers:** inner voice entrances**. Red markers:** overall timing duration (min.s.ms.), **Red markers between graphs:** timing deviations.

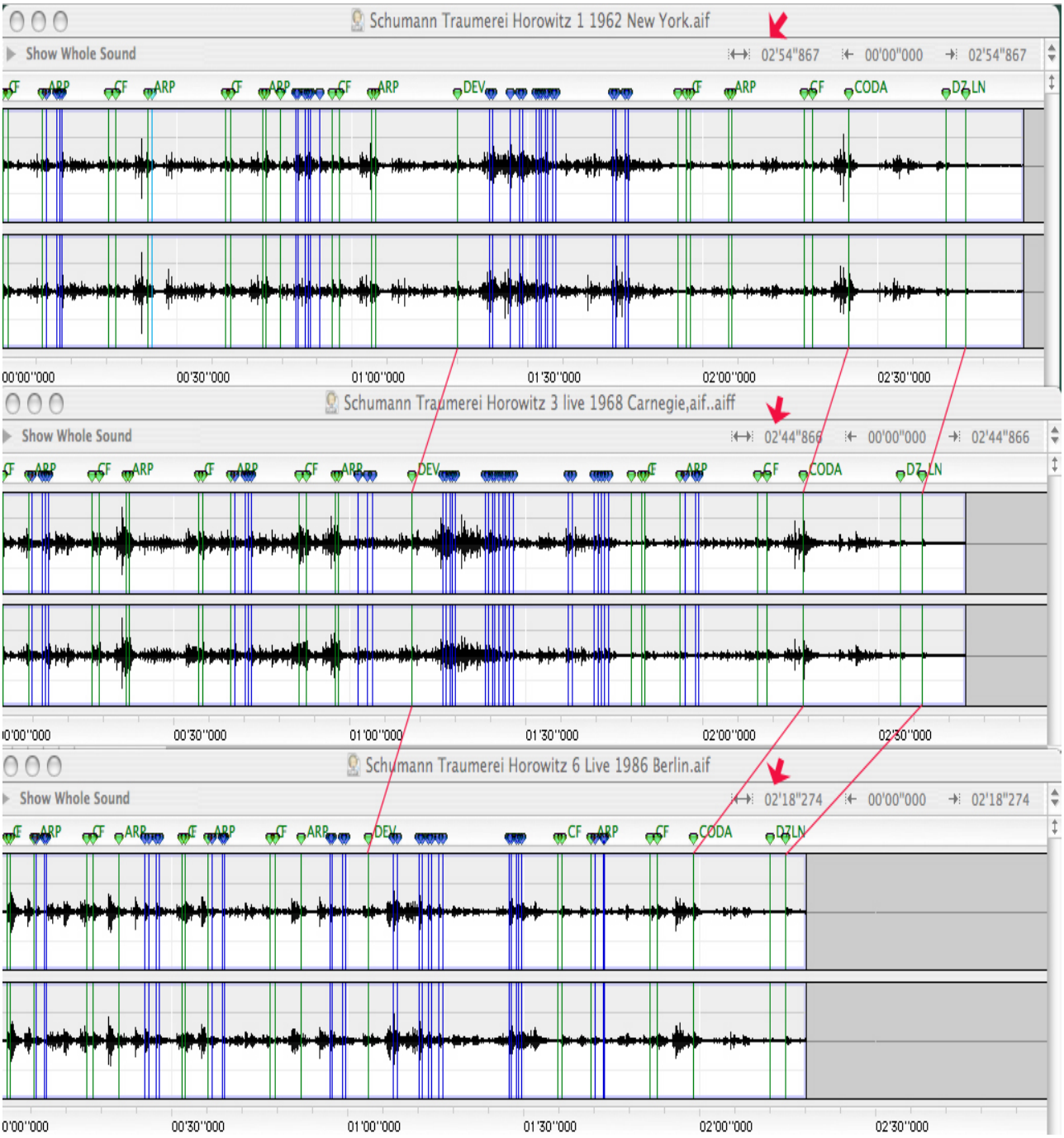


Figure 5.5. Amplitude Timeline of three performances by Vladimir Horowitz of Robert Schumann's *Träumerei*. **Green Markers**: CF-opening notes of Principal Theme (PT), ARP-*arpeggio* – broken chord, DEV-development section, D7- (dominant seventh) harmonic tension at the ending of composition (cadence) LN – last note entrance and harmonic resolution.
Blue Markers: inner voice entrances**. Red markers:** overall timing duration (min.s.ms.),
Red markers between graphs: timing deviations.

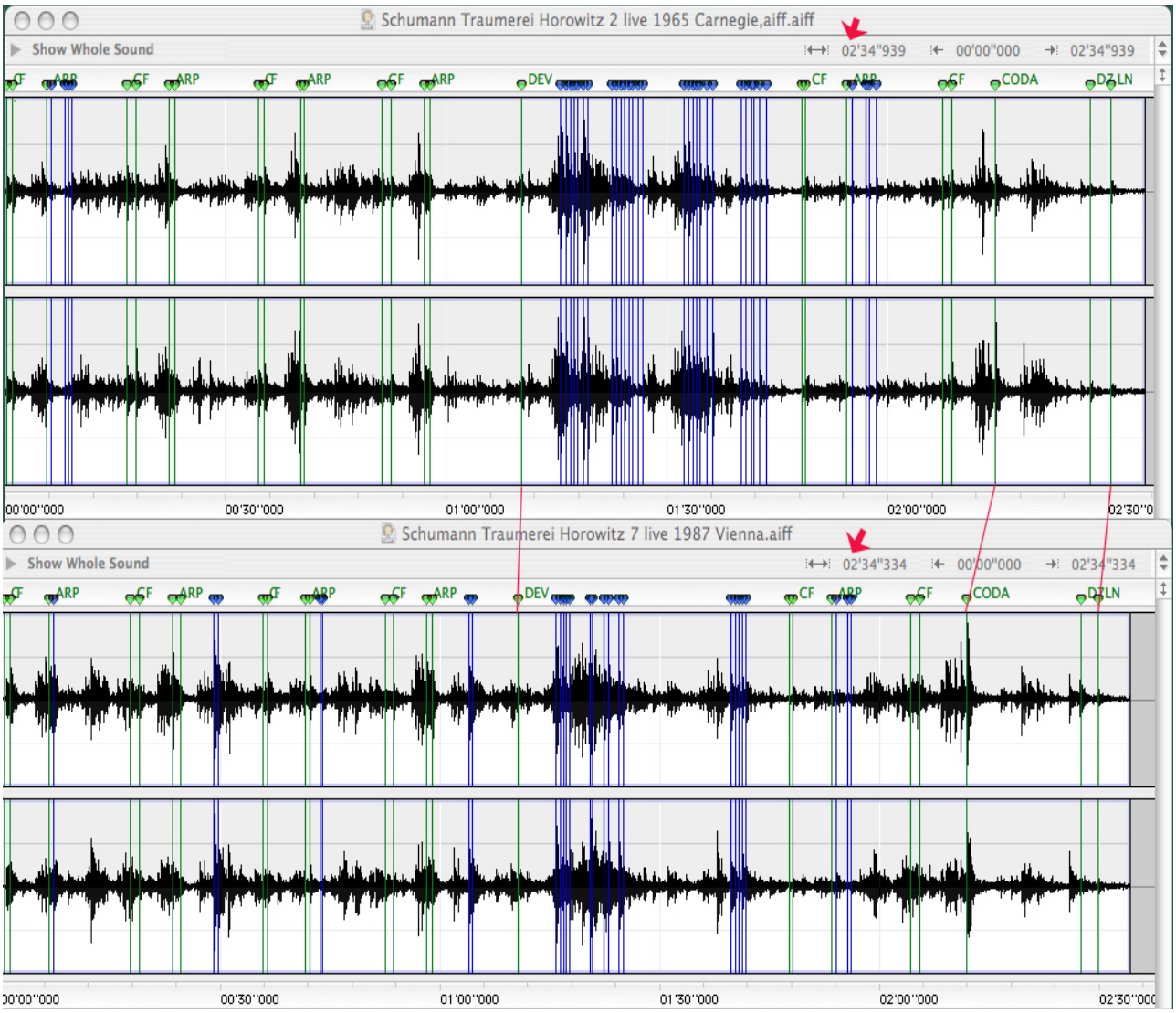


Figure 5.6. Amplitude Timeline of two performances by **Vladimir Horowitz - 02'34" live** of Robert Schumann's *Träumerei*. **Green Markers**: CF-opening notes of Principal Theme (PT), ARP- *arpeggio* – broken chord, DEV-development section, D7- (dominant seventh) harmonic tension at the ending of composition (cadence) LN – last note entrance and harmonic resolution. **Blue Markers:** inner voice entrances**. Red markers:** overall timing duration (min.s.ms.), **Red markers between graphs:** timing deviations.

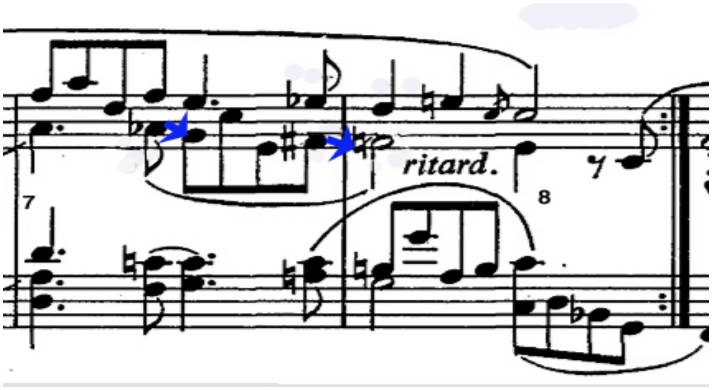
Date / Place	Live / Studio	Overall Duration Min.s.ms.	Opening Bar 1-8 Min.s.ms.	Development Bar 9-16 Min.s.ms.	Fermata Bar22 Min.s.ms.	D7- LN Bar 24 Added fermata Min.s.ms.
1962 New York	Studio	02’54”867	01’18”066	00’38”005	00’04”517	00’03”474
1965 Carnegie	Live	02’34”939	01’10”368	00’36”404	00’03”578	00’02”956
1968 Carnegie	Live	02’44”866	01’10”625	00’37”409	00’04”605	00’03”837
1986 Moscow	Live	02’23”134	01’03”962	00’32”670	00’04”083	00’02”917
1986 Leningrad	Live	02’20”721	01’02”561	00’32”523	00’03”937	00’02”625
1986 Berlin	Live	02’18”274	01’03”523	00’30”413	00’03”662	00’02”506
1987 Vienna	Live	02’34”334	01’10”872	00’35”439	00’04”219	00’02”813
1987 Hamburg	Live	02’29”627	01’07”879	00’34”500	00’04”347	00’02”293

Table 5.2 Comparative timings of overall durations and durations of main structural divisions of Vladimir Horowitz performances of Robert Schumann *Träumerei.*

Moscow, Leningrad and Berlin: Measures 7-8: Over all and internal timings

These analyses refer to Figures 5.7/a, 5.7/b. Horowitz's Moscow, Leningrad and Berlin performances of measures 7-8 illustrate some of the issues that his micro-timings deal with in identifying the consistent and creatively varied features of his performing signature. The overall durations, for example, of the voice line sequencings are virtually identical in all three performances (Table 5.3). The internal timings, however, of note-to-note entrances, their durations, intensities groupings, and spacings are more distinctively varied. In his Moscow performance, Horowitz emphasizes strongly defined entrances in both measures separated by note-to-note durations and spacings that differ in detail from his other performances of the two measures. (Figure 5.7/a) In his Leningrad performance he also begins with a marked stress but follows through with distinctive spacings at a quicker pace and more diverse note-to-note durations and intensities than his voice line sequencings of the Moscow and Berlin performances . (Figure 5.7/b)

As noted above, Horowitz's practice of varying minute durations and their expressive emphases in successive voice leadings (alto in this example) brought a seemingly paradoxical element to his repeated performances. For example, his micro timed lengthening of a note may be balanced by the shortening of one or more of the succeeding notes. The balancing act is rarely exact but it is invariably a musically satisfying experience. These subtly micro-timed adjustments provide the consistent and creatively varied elements of the passage with a distinctive finishing touch (Table 5.3).



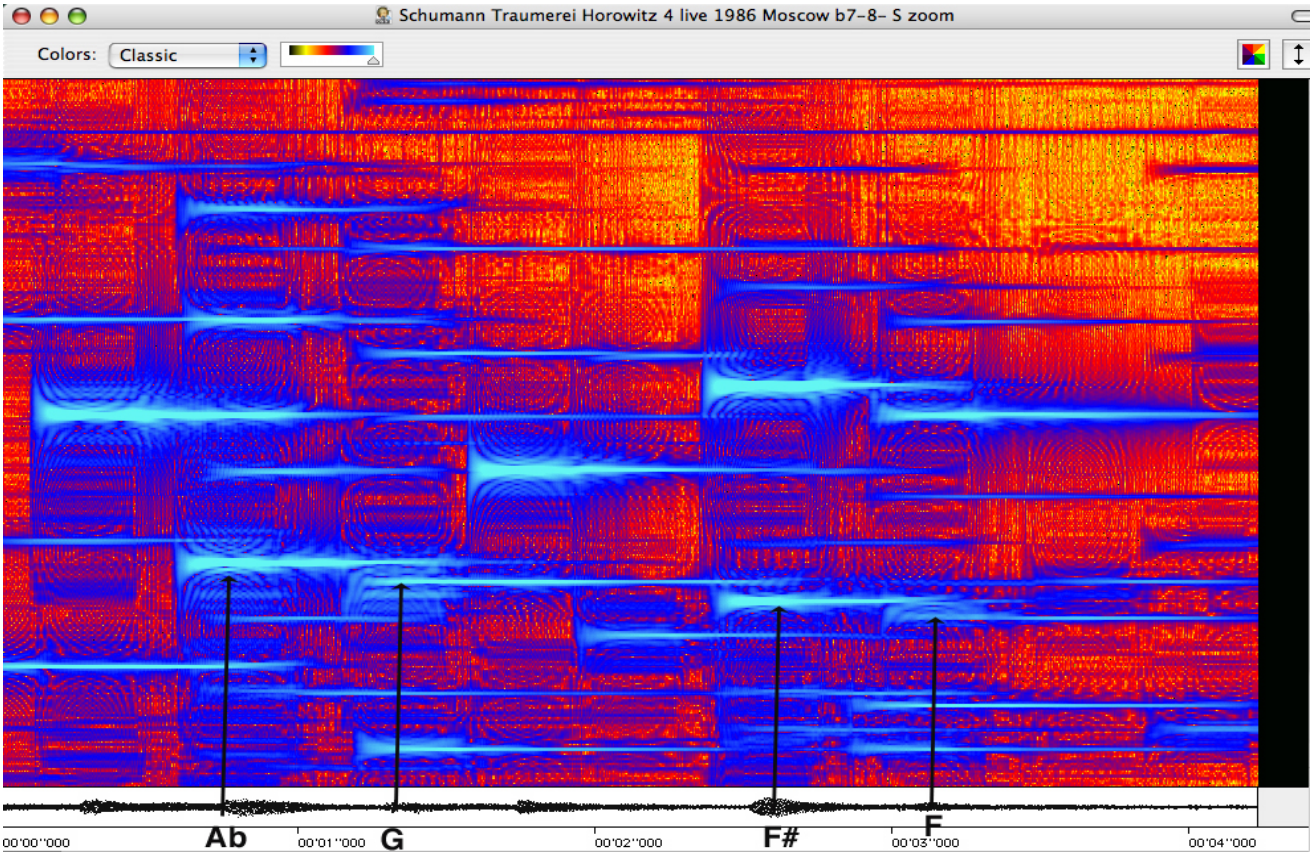
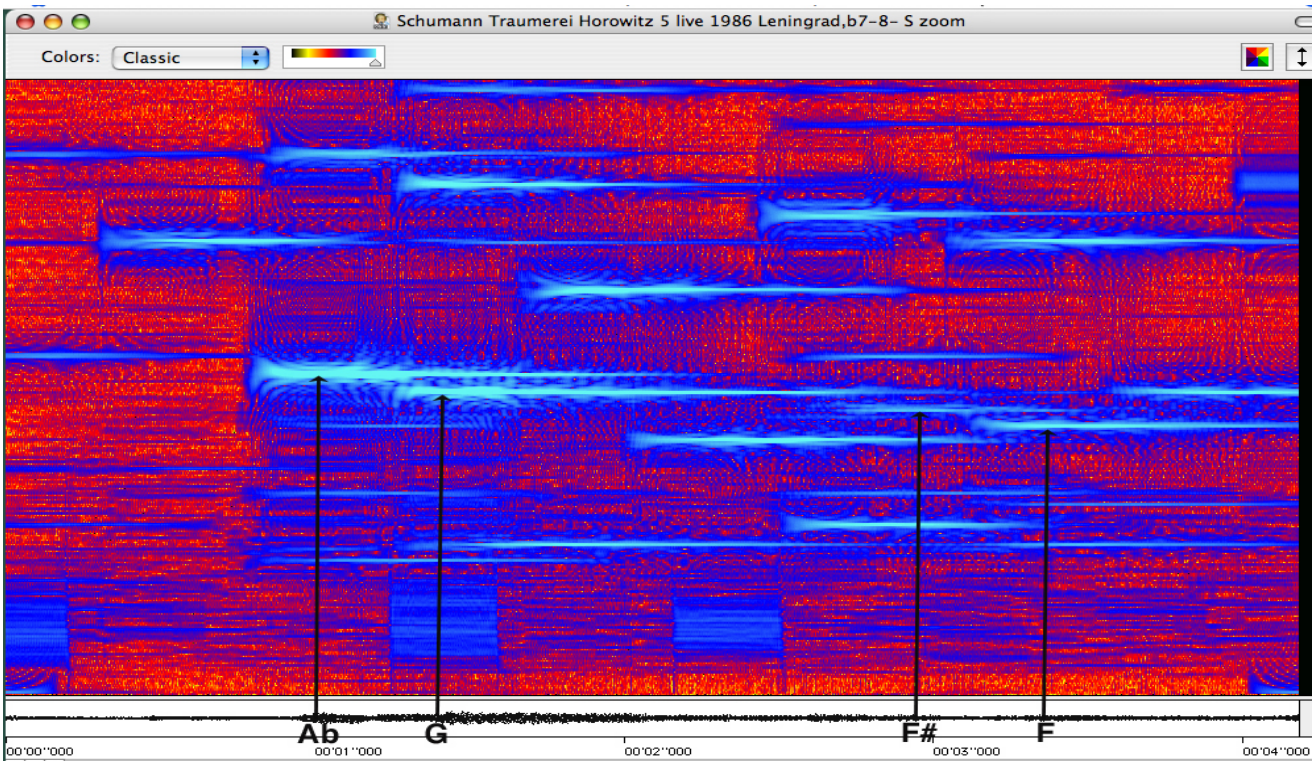


Figure 5.7/a. Robert Schumann *Träumerei* Measure 7-8 Vladimir Horowitz 1986 in Moscow. **Score: blue markers** -inner voice emphasis.
Spectrogram: black markers: inner voice inner voice entrances, emphasis and harmonic relationships.



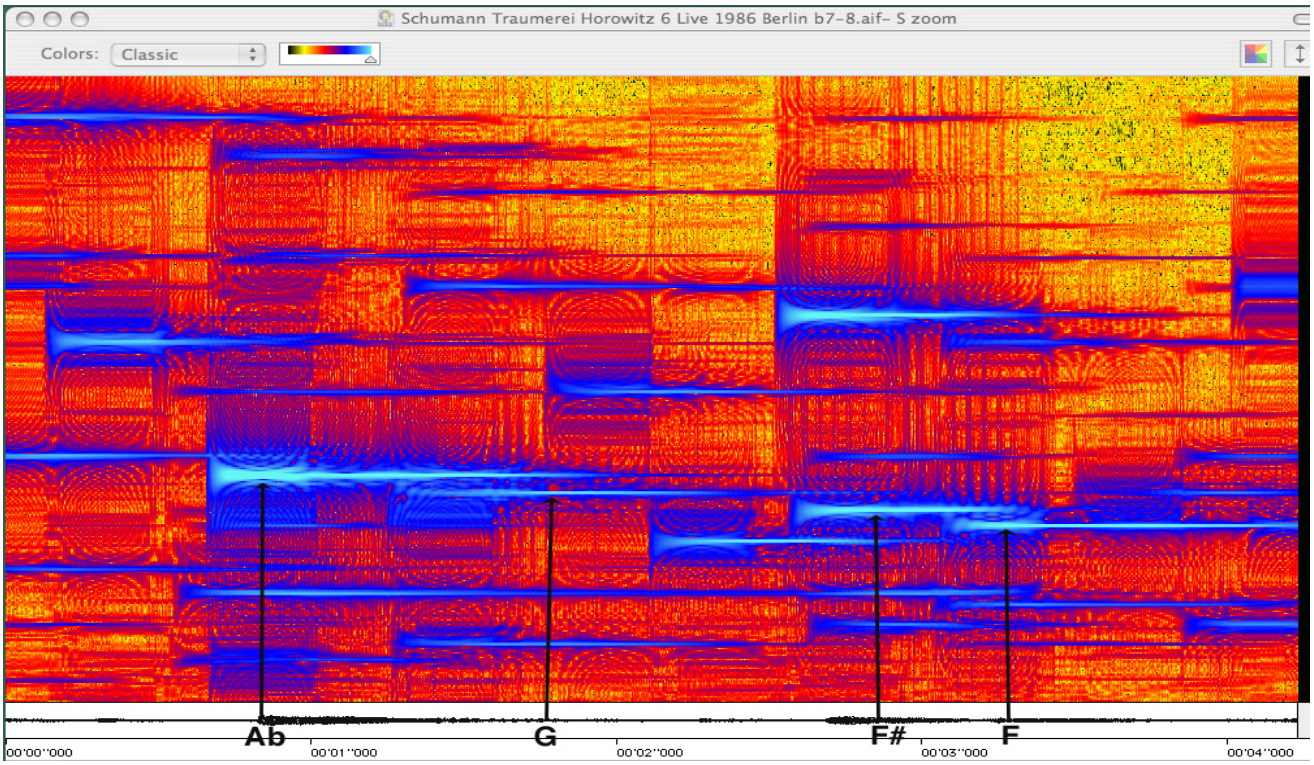


Figure 5.7/b. Robert Schumann *Träumerei* Measure 7-8 Vladimir Horowitz 1986 in Leningrad and in Berlin. **Spectrogram: black markers:** inner voice entrances, emphasis and harmonic relationships.

Date / Place	Live / Studio	Overall Bar 7-8 Min.s.ms.	Ab-G Bar 7-8 Min.s.ms.	F#-F Bar 7-8 Min.s.ms	Eb-D Bar 7-8 Min.s.ms
1962 New York	Studio	00’10”277	00’00”674	00’00”499	N/A
1965 Carnegie	Live	00’08”878	00’00”549	N/A	00’00”574
1968 Carnegie	Live	00’09”392	00’00”559	00’00”652	N/A
1986 Moscow	Live	00’08”487	00’00”599	00’00”517	N/A
1986 Leningrad	Live	00’08”409	00’00”457	00’00”337	N/A
1986 Berlin	Live	00’08”147	00’00”601	00’00”577	N/A
1987 Vienna	Live	00’08”844	00’00”625	N/A	00’00”517
1987 Hamburg	Live	00’08”485	00’00”599	N/A	00’00”624

Table 5.3 Comparative timings of overall and note – to note durations of Measure 7-8 of Vladimir Horowitz’s performances of Robert Schumann’s *Träumerei.*

Horowitz's mastery of conversational exchanges between two or more voices is undoubtedly his most accessible means of communication. The following examples illustrate the main features of the conversational experience.

Conversational voicings: up beat accent, bar line overlapping and micro-timed distinctions

These analyses refer to Figure 5.8. Measures 7-8 of the Vienna (1987) and Hamburg (1987) recordings. These two excerpts illustrate the part Horowitz's expressively directed micro timing plays in creating different conversational exchanges between the alto and soprano voices. The Vienna excerpt opens with a two note alto motif (A Flat-G) that enters in measure seven with a strongly accented upbeat (represented as blue, thick and spiked) that reverberates over the following unstressed down beat on G (blue and thin). The soprano voice motif that follows (E flat-D) enters with a moderately accented and lengthened upbeat that crosses the bar line to complete the brief conversation on the down beat in measure eight.

Horowitz creates a more intimate conversation between the two motifs in his Hamburg performance. The entering alto voice motif (A flat-G) is less prominent and lengthy than that of the Vienna performance. The soprano motif (E flat-D) follows with a slightly more defined upbeat then the preceding alto entrance. There is little in the micro timing of durations and dynamic stress to suggest the Vienna conversation between contrasting motifs (Table 5.3).

The most significant details in both examples are a) the stressed upbeats and the minutely timed lengthening of their durations b) the unstressed downbeats in both the alto and soprano voices and c) the overlapping of the bar line in the soprano voice. Despite the expressive distinctions between these two versions of *Träumerei,* Horowitz causes both to stand out by reversing the traditional emphasis on a short, unstressed upbeat followed by a more prominent downbeat. The alto to soprano voice line exchanges are accordingly heard as conversations between voices each of which brings a distinctive perspective to the notated score.

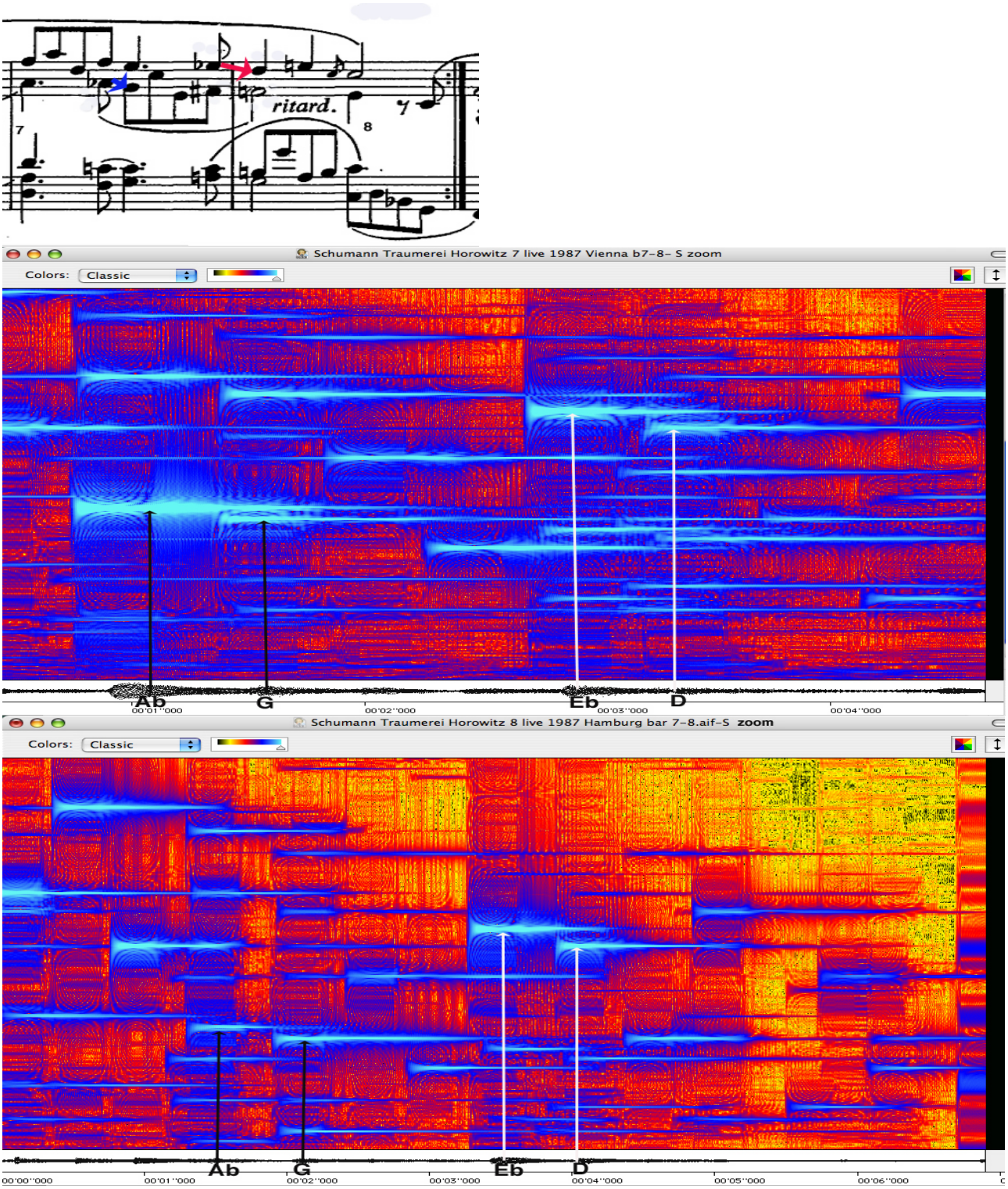


Figure 5.8. Robert Schumann *Träumerei,* Measure 7-8 Vladimir Horowitz 1987in Vienna and Hamburg. **Score: blue markers** -inner voice emphasis, **red markers** -upper voice emphasis. **Spectrogram: black markers:** inner voice entrances, **white markers:** upper voice entrances emphasis and harmonic relationships.

Horowitz's performance of the following passage is an outstanding example of a creatively inspired concept that is heard simultaneously as a conversational exchange of voices and an unbroken melodic line (see Figure 5.9, Measures 10- 13, Moscow, 1986). The exchange takes place between an identical sequence of six tones (measures 10-11) in the soprano voice (white markers) that repeats itself (measures 11-12) in the alto and tenor registers (black markers) The conversation is completed (measures 12-13) with a bass motif that is answered by the soprano voice. In vocal terms Horowitz did all of it in one breath.

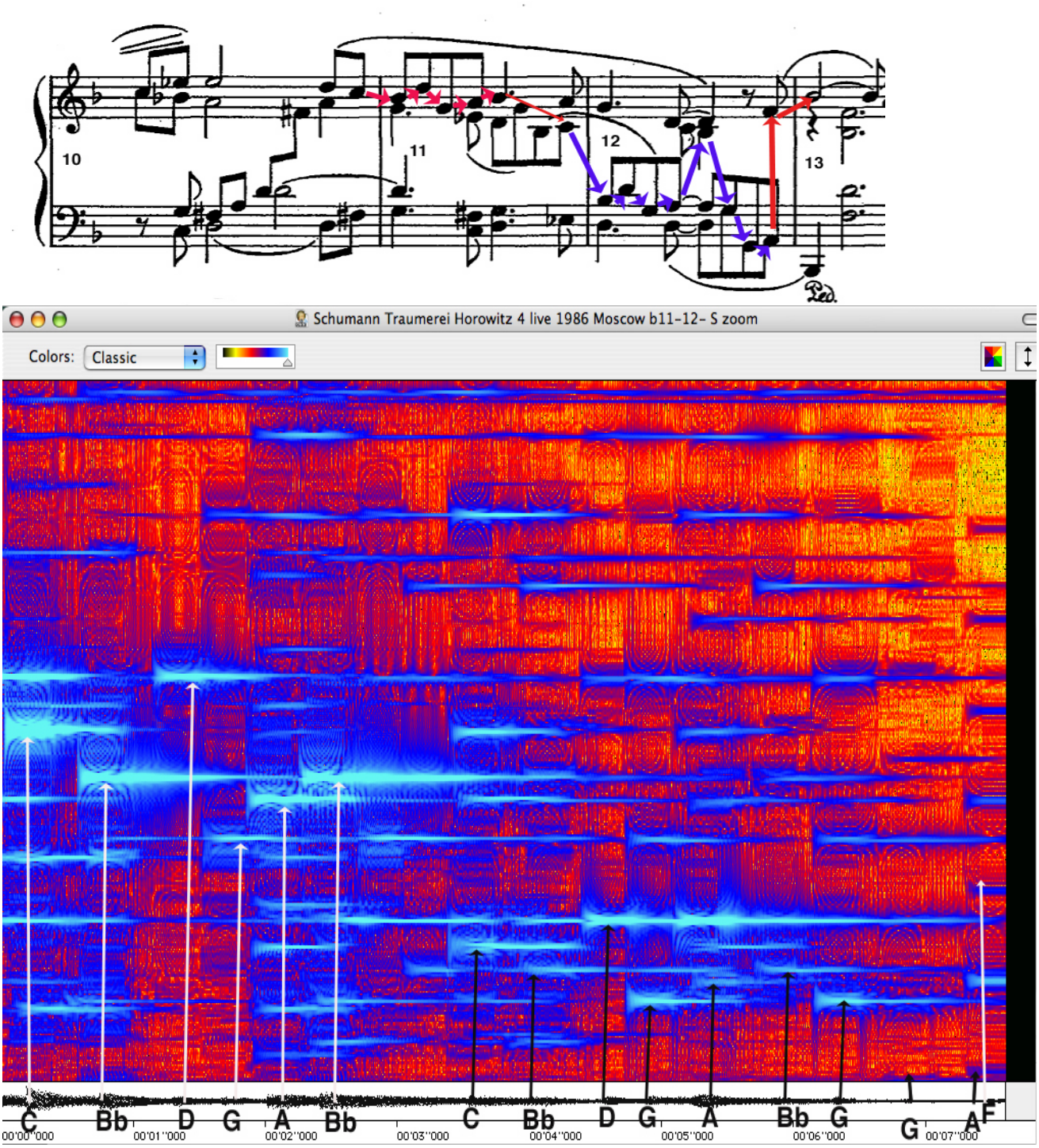


Figure 5.9 Robert Schumann *Träumerei,* Measure 11-12. Vladimir Horowitz1986 in Moscow. **Score: blue markers** -inner voice emphasis, **red markers** – upper voice emphasis. **Spectrogram: white markers:** upper voice entrances **black markers:** inner voice entrances, emphasis and harmonic relationship.

Two minutes and thirty-four seconds: Twenty-two years apart

The comparative analyses of Horowitz's Carnegie Hall (1965) and Vienna (1987) performances bring a detailed perspective to the apparent contradictions in the timing relationships that often enter into the musical experiences he created: notably when his overall timings are identical while the internal contexts differ from each other in their temporal relationships. The contradictions begin to make sense when one considers how effectively Horowitz employs expressively directed micro-timing, as he does in the above context to balance off temporal differences.

Figures 5.10/a, 5.10/b, 5.11, 5.12, 5.13 and Table 5.4 below provide a specific perspective on Horowitz's micro-timing of complete structural division of *Träumerei.* The figures show how his command of millisecond to one-second temporal distinctions in his voicings was the primary agent in communicating the varied number of experiences he was able to create out of the same material. Micro-timing can therefore be considered an "eminence gris" of sorts that shapes the experience but is difficult to pin down.

The Bebung effect. The amplitudes and note-to-note micro-timings of the Carnegie and Vienna tenor voice entrances in measures 1-6 are comparatively analyzed in Figures 5.10/a and 5.10/b. Table 5.4 shows the comparatively measured micro-timings of the two performances. Spectrographic analyses in Figure 5.10/b compares the role of harmonic resonance in communicating note-to-note articulations in both performances. In his Vienna performance Horowitz organizes the harmonic resonances of the piano to create a *bebung (vibrating)* effect on a single note of the arpeggio in measure six (Marcuse, S.1975 p.114). The pitch of the note (A) is not repeated by means of a finger

stroke but by the pedaled micro-timing of the resonating overtones. It is, however spectrographically represented as a faint repetition of the original pitch.(Figure 510/b) This can be seen in white markers that point to the representations.

Horowitz prepares the *bebung effect with* a declamatory build up of five soprano notes that turn the arpeggio into a measured note-to-note melodic line. On reaching the peak of the phrase (A-A) he increases the resonance with a retard that allows him to prepare the *bebung* effect.

This concluding discussion of the comparative analyses of Horowitz's repeated performances of Träumerei will focus on his creatively varied treatments of the composition as a whole. For the sake of convenience the ternary form of *Träumerei* will be employed as a working reference in the following order: Exposition, (measures 1-8), Development (measures 9-16), and Recapitulation (measures 17-24). The comparative analyses of each section will be confined to Horowitz's Carnegie (1965) and Vienna (1987) performances.

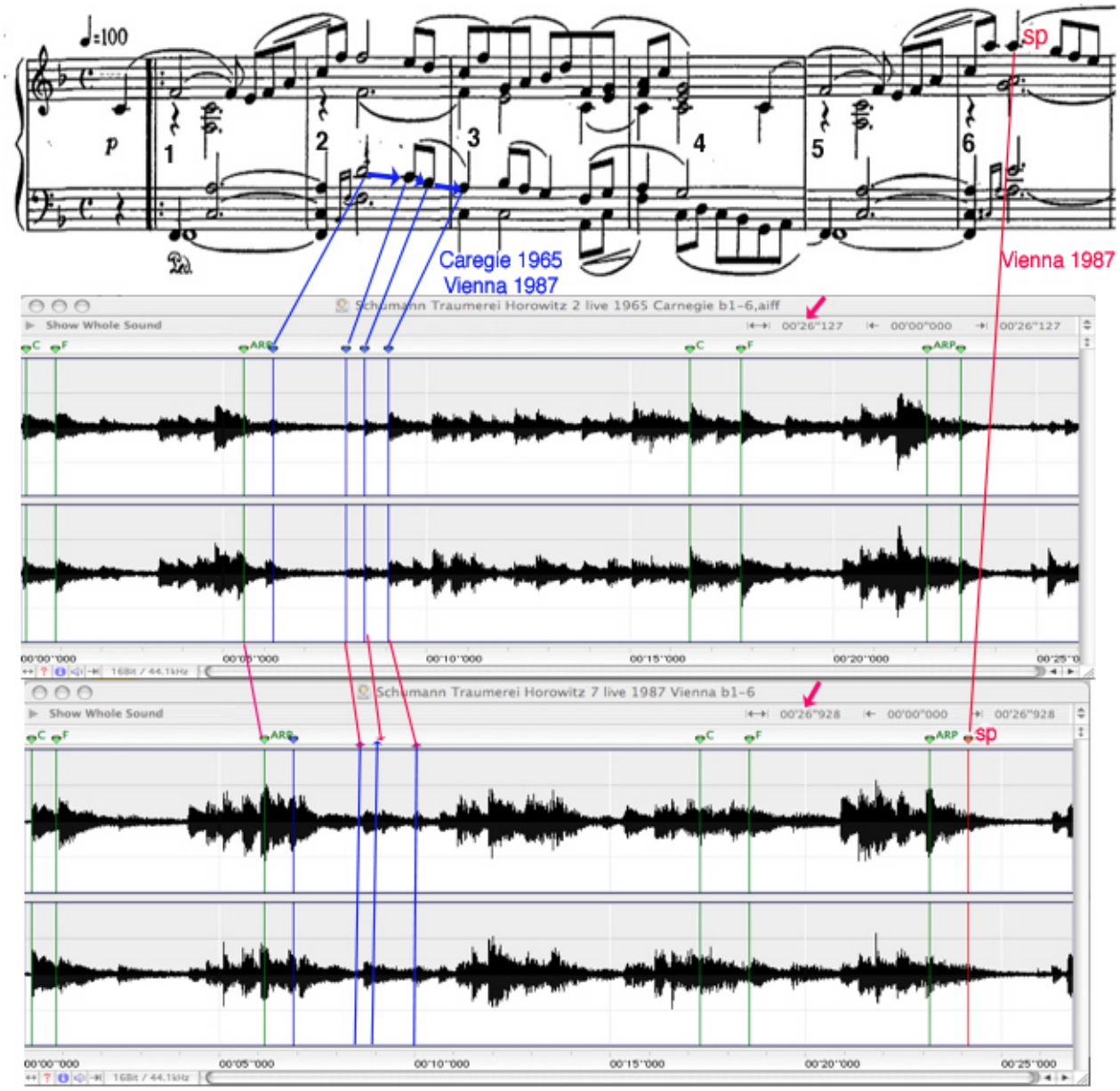


Figure 5.10/a. Robert Schumann *Träumerei,* Measure 1-6. Vladimir Horowitz, 1965 in Carnegie and 1987 in Vienna. **Score - Blue markers**: inner voice entrances, **Red marker - sp** (*subito* piano *bebung* effect) **Amplitude Timeline - Blue markers**: inner voice entrances, **Red marker - sp** (*subito* piano *bebung* effect) **Red markers:** overall timing duration (min.s.ms.), **Red markers between graphs:** timing deviations,

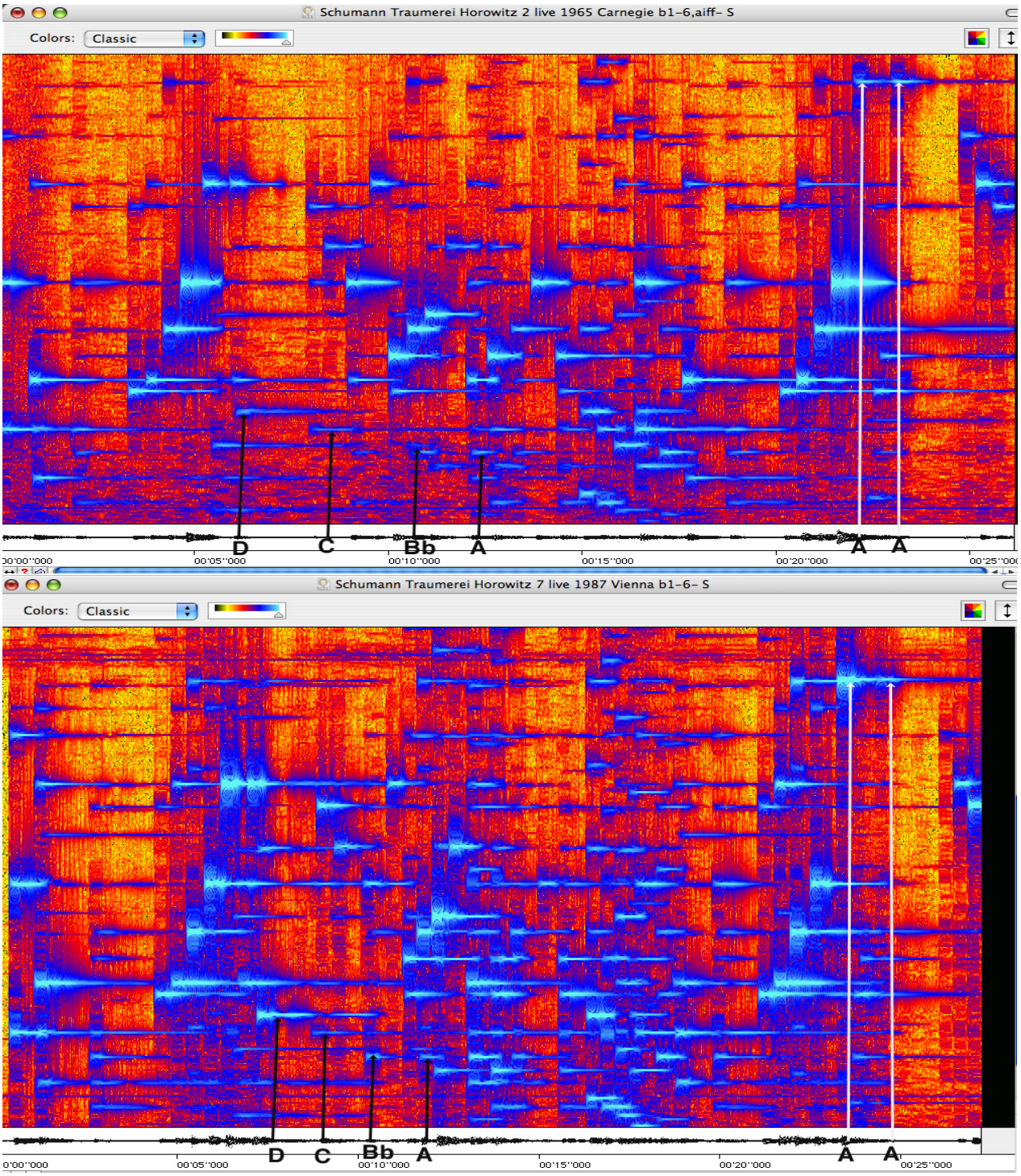


Figure 5.10/b. Spectrogram - R.Schumann *Träumerei,* Measure 1-6.
Vladimir Horowitz 1965 in Carnegie, 1987 in Vienna. **Black markers:** inner voice entrances, **white markers:** upper voice entrances**,** emphasis and harmonic relationships. (*Bebung* A-A-Vienna performance)

Date & Place	Overall Duration Min.s.ms.	Exposition Bar 1-8 Min.s.ms.	Arpeggio ARP Bar 6 Min.s.ms	Development Bar 9-16 Min.s.ms.	Recap. Bar 17-24 Min.s.ms.	Fermata Bar 22 Min.s.ms.	D7- LN Bar-24 Added Fermata Min.s.ms.
1965 Carnegie Live	02’34”939	01’12”683	00’0”788	00’36”404	00’42”815	00’3”467	00’2”978
1987 Vienna Live	02’34”334	01’13”178	00’1”357	00’35”527	00’42”900	00’4”257	00’2”534

Table 5.4 Comparative timings of the overall durations and durations of the main structural divisions of Vladimir Horowitz’s performances of Robert Schumann *Träumerei* in 1965 at Carnegie Hall and in 1987 in Vienna.

Exposition: Measures 1-8. (Figure 5.11)

The Amplitude timeline representation in Fig. 5.11 shows the nearly identical overall durations of the two performances. Distinctions between amplitude intensities can be seen from the opening measure of the Exposition through to its conclusion in measure eight. Most striking are the arpeggiated sequences in measures two and six as well as the retard and grace note in the top note of measure eight. Differences in Horowitz's micro timings of note-to-note entrances, durations and sequencings are equally evident throughout the exposition. Horowitz also emphasizes the tenor counter line in measure 2 with up beat stresses that lead to less marked down beats of the alto line measures 5-6.

Apart from his creatively varied micro timings, bebung effect and reversals of notated stress patterns both of Horowitz's performances are within the boundaries set by traditional practice: that is, he plays most of the notes in the Exposition as written.

Development: Measures 9-16. (Figure 5.12)

Horowitz treats the eight-measure development section of Träumerei as an opportunity to demonstrate the built in possibilities of a few moments of great music (Table 5.4). In measure 10 he immediately sets up a pattern of cross voicings between the tenor and alto registers. This is followed by measures 11 and 12 with a conversational exchange between the alto and tenor voices that characteristically overlaps the bar line of measure twelve. Most relevant is how Horowitz employs the conversation to direct attention to a change of key in measures twelve to thirteen. In measure 14 he uses the identical voicing sequence to lead back to the main key in measure 16.

The overall durations of the Development section are identical in both performances as are the opening notes. The note-to-note durations, as well as their groupings, spacings and articulations are markedly different. Note in particular the contrast between durational spacings in measures 9-16. In a similar vein the representations of amplitude intensities differ at virtually every step in the musical line.

Recapitulation: Measures 17-24 (Figure 5.13)

The overall durations of the Recapitulation almost equal (85ms.appart) in both performances; thereby following the pattern set by the Exposition and Development sections. Note-to-note durations and amplitudes are typically distinct as are the groupings and spacings.

The most significant feature of the Recapitulation in these two performances is the fermata Horowitz added to the penultimate dominant seventh chord in the final measure. He micro timed the duration of the fermata to create an indefinite atmosphere - a suspension of time that cast a moment of doubt on what- if anything - will come next. The pause is a variant of the surprise effect Horowitz frequently employed to bring a novel perspective to a familiar work. Table 5.2 shows Horowitz's repeated micro timings in all eight performances of the added fermata. In the present instance his fermata over the dominant seventh chord reverses the normal order of a final cadence by suspending the length of the penultimate beat before it dissolves into the final chord. This reversal of standard practice is a consistent feature of Horowitz's performing voice.

All things considered,the most outstanding feature of Horowitz's signature voicings is how they can turn minute changes in timing into entirely new musical experiences. These are shown in Figures 5.11, 5.12, 5.13.

Small repeated changes. Big differences in the experience.

Summary: Consistency of Horowitz's expressively directed and micro-timed voicing.

(1) Inner voice leadings that are prominent in all examples.

(2) Conversational voice leadings in the Development Section.

(3) Bar line overlapping of voice leadings in all examples.

(4) Up beat timing and stress emphasis over the following down beat in all examples.

(5) Surprise transformations of rapid arpeggios into slowly paced melodic lines in the Introduction and Recapitulation of the Vienna performance

(6) Surprise addition of a fermata on the dominant 7th chord of the final measure in all eight performances.

The analytical sequencing of the three sections of Träumerei illustrate unequivocally how even the slightest micro-timed changes in amplitude, timeline, stress or voicing can profoundly alter one's perception of a musical experience. Horowitz's command of mini-second distinctions is comparable to the stroke of a master painter's brush in the act of transforming a frown into a smile. Like that of the master painter it may be the ultimate test of Horowitz's art. The bebung effect, for example in measure 8 of the Vienna Exposition section not only differs from the Carnegie performance of the measure, but alters one's perception of the Träumerei experience as a whole (Figure 5.11). In a

similar vein the overall durations of the Development section (Figure 5.12) in both performances are almost identical yet Horowitz's subtly varied tenor and alto voice lines add up to distinctive musical experiences.

The overall timings of the Recapitulation (Figure 5.13) were again almost identical (Table 5.4). Here the difference between the two performances is clearly evident in the way Horowitz approached the fermata in measure twenty-two. In his Vienna performance he employed a declamatory note-to-note sequence that provided a dramatic sense of inevitability when it reached the fermata. The result was a considerable lengthening of the measure (Table 5.4) In the Carnegie performance Horowitz treated the same passage as a lyrically expressed melody moving to a point of rest. Amplitudes were less marked and durations were shorter than those of the Vienna performance. The comparative timings of the added fermata over the dominant 7th in measure 24 differed by 444 milliseconds (Table5.4).

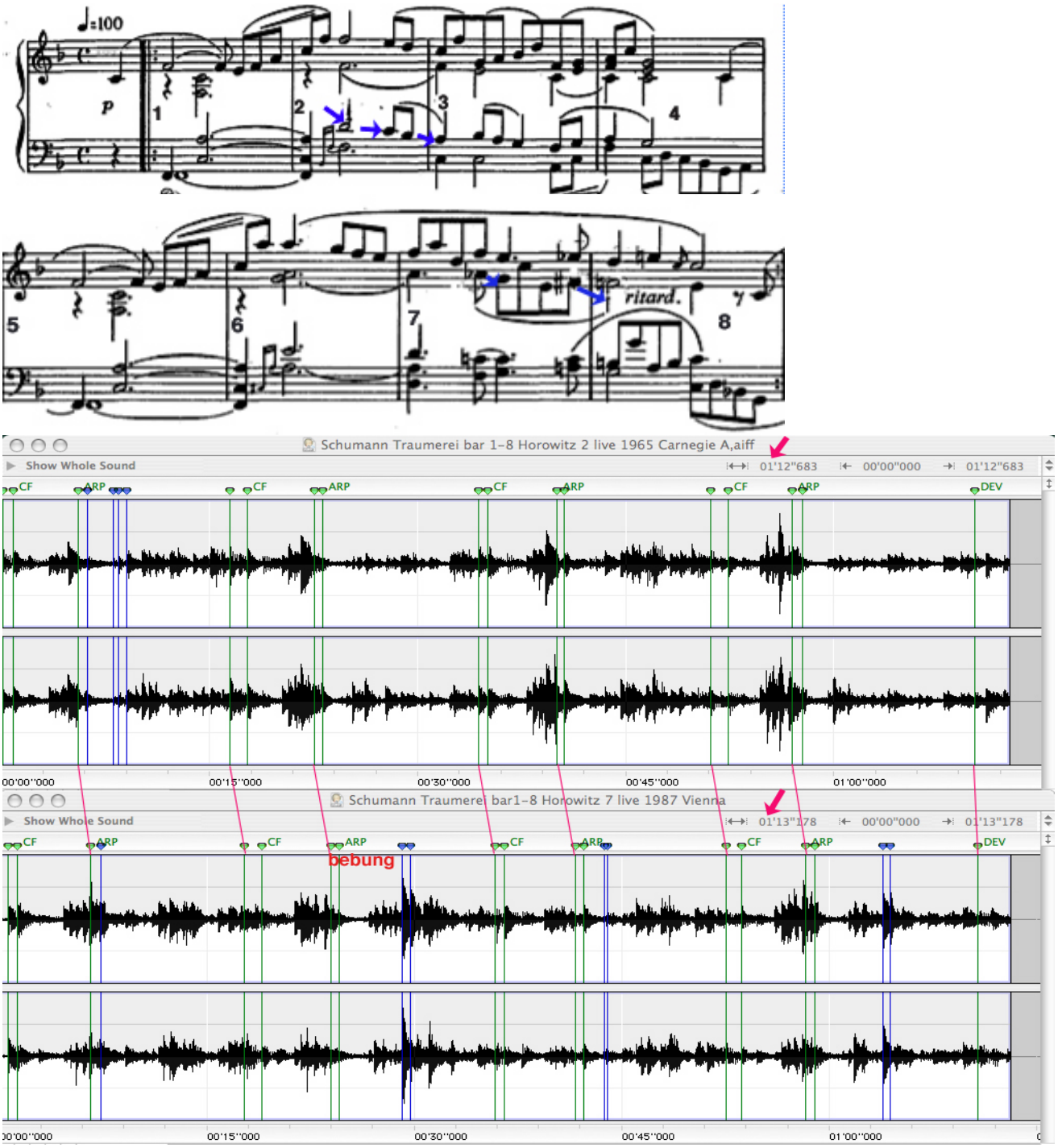


Figure 5.11 Robert Schumann *Träumerei,* Exposition: Measure 1-8. Vladimir Horowitz, in Carnegie 1965, and in Vienna 1987. **Score - Blue markers**: inner voice entrances, **Amplitude Timeline**: **Blue markers**: inner voice entrances, **Green markers:** structural points. **Red markers between graphs:** timing deviations. **Red markers:** overall timing duration of the excerpt. (Min.s.ms.)

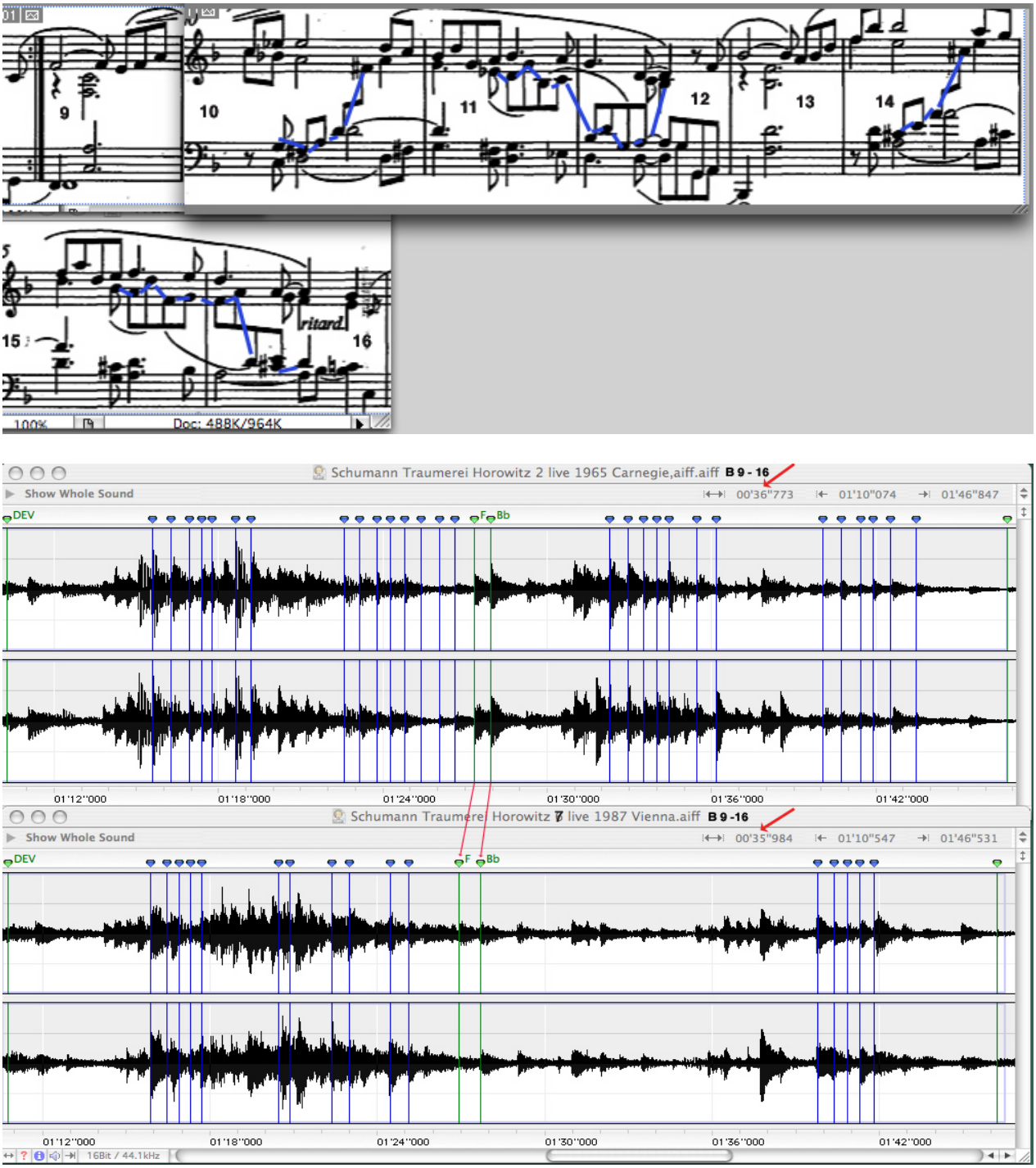


Figure 5.12. Robert Schumann *Träumerei,* Measure 9-16: Development. Vladimir Horowitz, 1965 in Carnegie and 1987 in Vienna. **Score - Blue markers**: inner voice. **Amplitude-Timeline: Blue markers**: inner voice entrances, **Green markers:** structural points. **Red markers between graphs:** timing deviations. **Red markers:** overall timing duration of the excerpt. (Min. s. ms.)

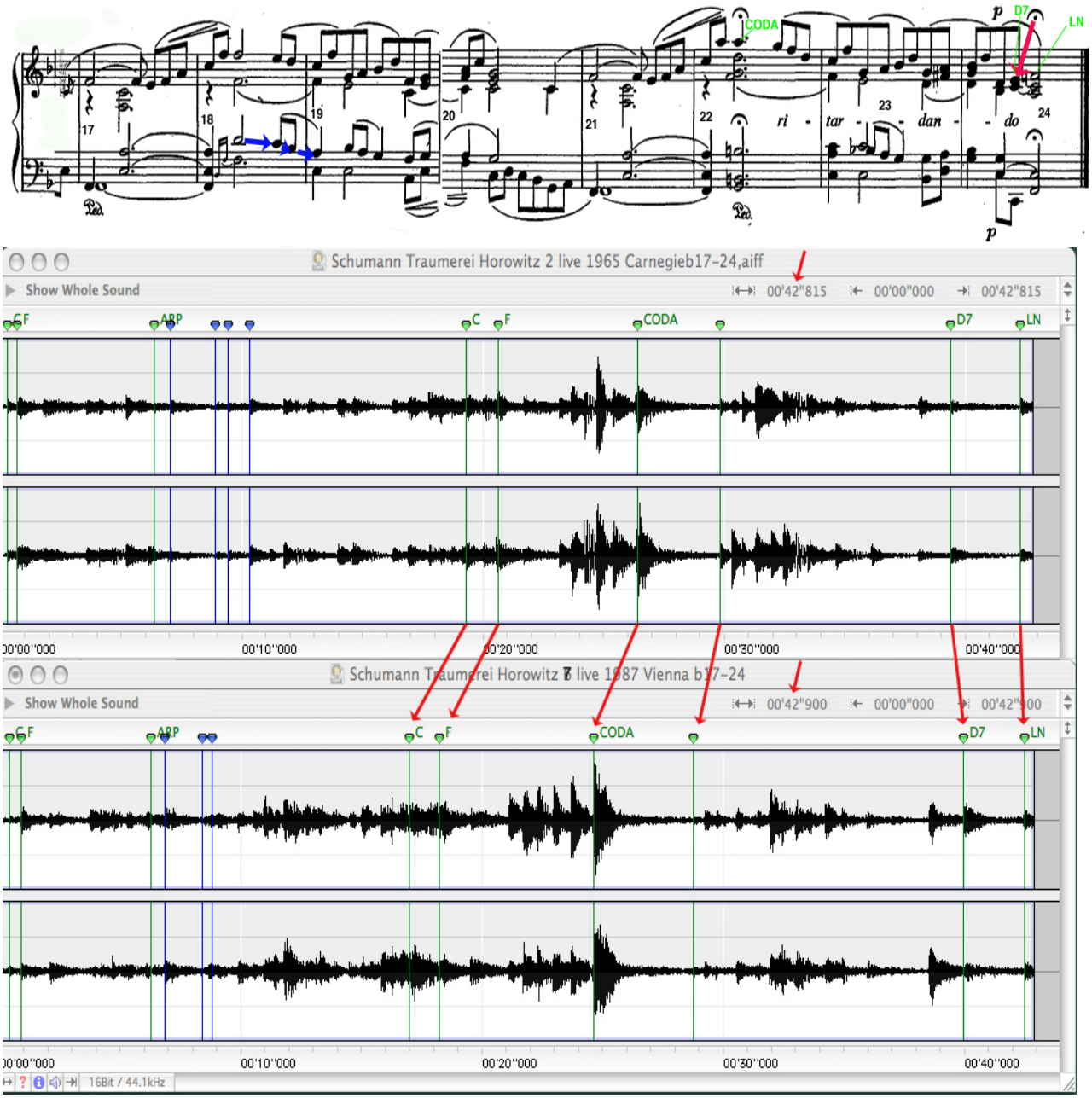


Figure 5.13 Robert Schumann *Träumerei*, Measure 17-24. Vladimir Horowitz, 1965 in Carnegie, 1987 in Vienna. **Score - Red marker:** Horowitz change of composer's indication. (*Fermata* transfer from LN to D7), **Blue markers**: inner voice entrances, **Amplitude Timeline: Blue markers**: inner voice entrances, **Green markers:** structural points. **Red marker between graphs:** timing deviation. **Red markers:** overall timing duration of the excerpt. (Min. s. ms).

The comparative performance analyses of Horowitz's repeated performances of *Träumerei* complete the first stage of the present study. The discussion will now move on to the comparative analyses of his *Träumerei* performances with those of other highly accomplished pianists. The aim throughout will be to confirm the outstanding distinctions between Horowitz's performances and those other pianist in the study: namely how and why Horowitz's consistent and creatively varied features are the landmarks of his signature voice.

Comparative Performance Analyses: Vladimir Horowitz and four celebrated pianists

The discussion will now turn to the comparative performance analyses between Horowitz's performances of *Träumerei* and those of Alfred Cortot (1953), Benno Moiseiwitsch (1930), Martha Argerich (1984) and Lang Lang (2003). Cortot and Moiseiwitsch were colleagues of Horowitz during the early stages of his career. Argerich's career parallels that of his final years. Lang Lang is an acclaimed, post Horowitz pianist. His career is a product of the present century. All told the pianists selected for comparative analyses include a contemporary pianist as well as three of the most celebrated performing artists during Horowitz's lifetime.

Voice line timings - overall and internal

Voice line timings of the above four pianist are varied but none are as frequent or as diverse as Horowitz's characteristic exchanges between inner and upper voice leadings (see Figures 5.14/a and 5.14/b).

The absence of inner line voice entrances (blue markers) in the Amplitude Timeline representations is the most striking distinction between their performances and that of Horowitz. Every other pianist in the study communicated his or her expressive intentions by means of the soprano voice. There were, however, occasional suggestions of an exchange between voice lines. Argerich, Cortot and Moiseiwitsch, for example, digressed in the Development sections to brief conversations between to soprano and inner voice – albeit with muted inner voices.

Differences in the overall durations are marked by Lang Lang's lengthy timing (03'19''188) in contrast to Moiseiwitsch's (02'08"600) and that of Horowitz's (02'23" 134) (Table 5.5). Lang–Lang's overall duration is more than one minute longer than that of all the other pianists (Table 5.5). The atypical duration is largely due to a gradual retard that begins with the opening measures and continues through the *fermata* (measure 22) and the two concluding notes of *Träumerei*. There is no compensating shortening of durations or variability in note-to-note timing, groupings or amplitudes. The result is a *Molto Largo* (very slow) and rather sleepy *Träumerei.*

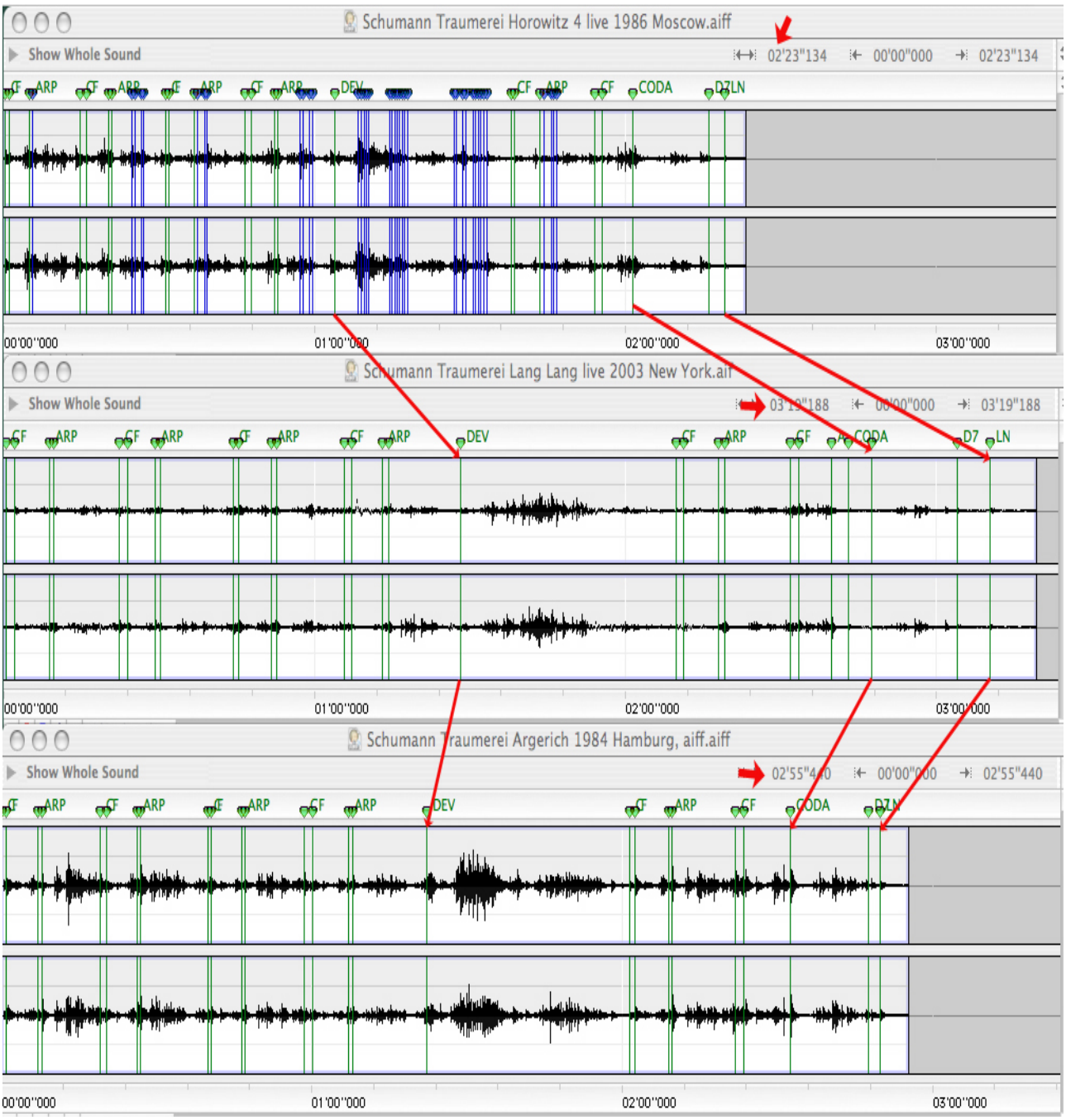


Figure 5.14/a. Amplitude Timeline: performances of Robert Schumann *Träumerei* - Horowitz, 1986, Lang-Lang 2003, and Argerich, 1984. . **Green Markers**: CF-opening notes of Principal Theme (PT), ARP- *arpeggio* – broken chord, DEV-development section, D7- (dominant seventh) harmonic tension at the ending of composition (cadence). LN – last note entrance and harmonic resolution. **Blue Markers:** inner voice entrances**. Red markers:** overall timing duration (min.s.ms.), **Red markers between graphs:** timing deviations.

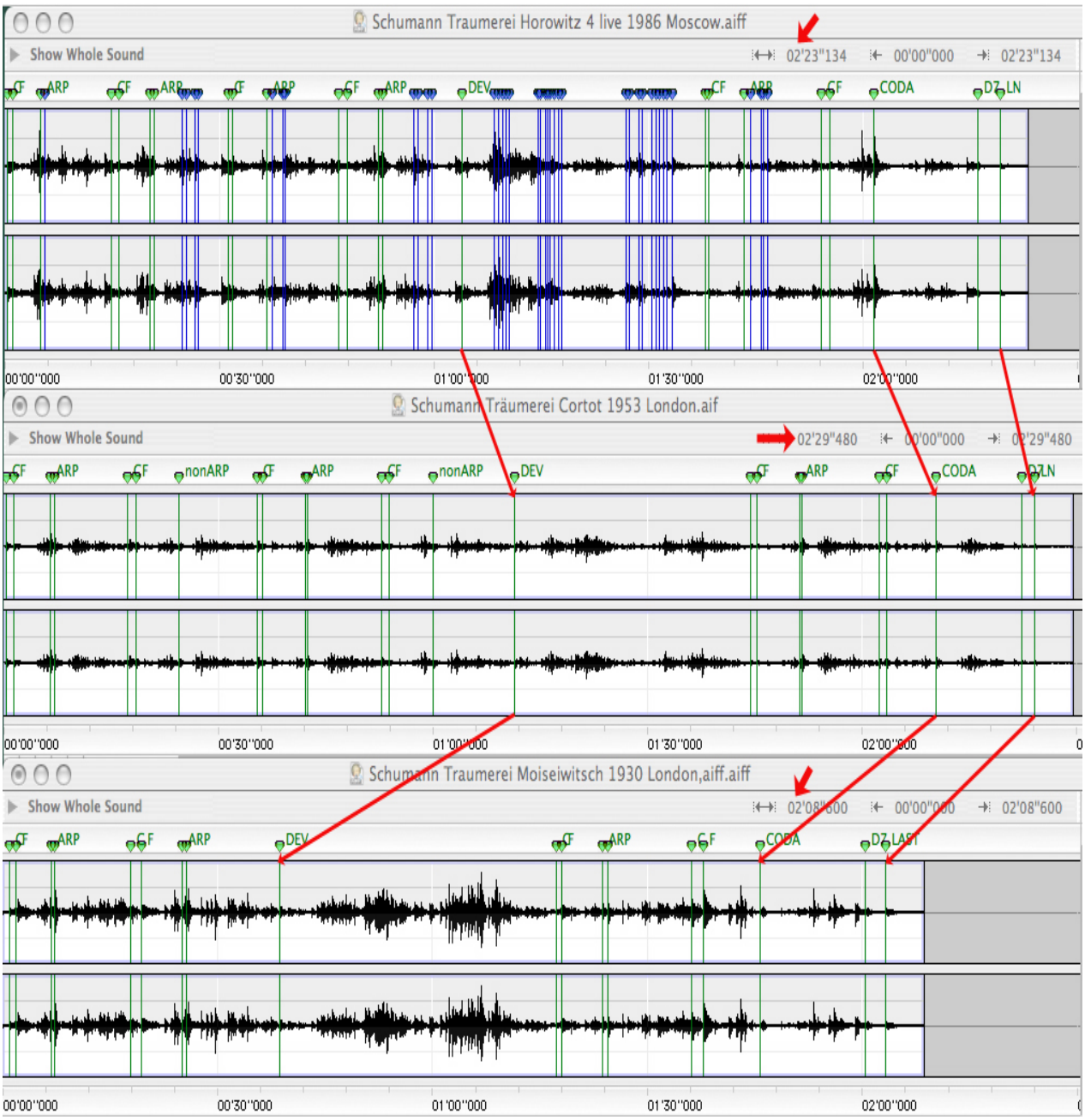


Figure 5.14/b. Amplitude Timeline: performances of Robert Schumann *Träumerei* - Horowitz, 1986, Cortot1953, and Moiseiwitsch,1930. **Green Markers**: CF-opening notes of Principal Theme (PT), ARP- *arpeggio* – broken chord, DEV-development section, D7- (dominant seventh) harmonic tension at the ending of composition (cadence). LN – last note entrance and harmonic resolution. **Blue Markers:** inner voice entrances**. Red markers:** overall timing duration (min.s.ms.), **Red markers between graphs:** timing deviations.

Artist	Date / Place	Studio Live	Overall Duration Min.s.ms.	Opening Bar - 1-8 Min.s.ms	Development Bar - 9 -16 Min.s.ms	Coda *Fermata* Bar - 22 Min.s.ms	D7-LN Bar -24 Min.s.ms
Horowitz	**1986 Moscow**	**Live**	**02’23”134**	**01’03”962**	**00’32”670**	**00’04”387**	**00’03”025**
Lang-Lang	2003 Carnegie	Live	03’19”188	01’28”081	01’40”175	00’04”912	00’06”877
Argerich	1984 Hamburg	Studio	02’55”440	01’22”132	00’38”206	00’04”358	00’01”996
Cortot	1953 London	Studio	02’29”480	01’11”309	00’32”297	00’02”931	00’01”823
Moiseiwitsch	1930 London	Studio	02’08”600	00’39”900	00’37”116	00’02”827	00’02”773

Table 5.5 Comparative timings of the overall durations and the primary structural divisions of Robert Schumann *Träumerei* performed by Vladimir Horowitz, Lang-Lang, Martha Argerich, Alfred Cortot and Benno Moiseiwitsch. (Note: Moiseiwitsch doesn’t repeat measures 1-8 as notated.)

It is interesting to see how within a time frame of 2 seconds (Table 5.6) the distinguishing characteristics of Horowitz's voice leadings immediately become apparent. These are shown in the blue colored voice line sequencings in Figures 5.15/a and 5.15/b The fact that Horowitz, unlike the other pianists, favors specific inner voice and cross-voicing relationships in a given context alters one's perception of the underlying structure of the passage as a whole.

Measures 7 and 8 show in a single example the distinctions between Horowitz's voice line relationships and those of the four other pianists in the study. The differences become evident when one compares the expressive choices of the latter with Horowitz's expressively micro timed exchanges between the soprano (white markers) and alto (black markers) voice lines (Figure 5.15/a). Whatever their individual differences may be the four other pianists preferred soprano line phrasings that rely on harmonic support from the inner voice lines for their expressive colorings. Apart from a passing alternation between voice lines, not one attempted to shape a novel musical experience out of a conversational exchange.

Each of the five pianists timed the overall duration of measures 7 and 8 differently. Neither did they time the eighth-note sequences in both measures as written. Cortot and Moiseiwitsch carried variability in timing a step further by adding their own micro- timed arpeggiations to measure. Their arpeggiated additions to the score were in keeping with performance practices that were phased out in the early 20th century (Hamilton, 2008).

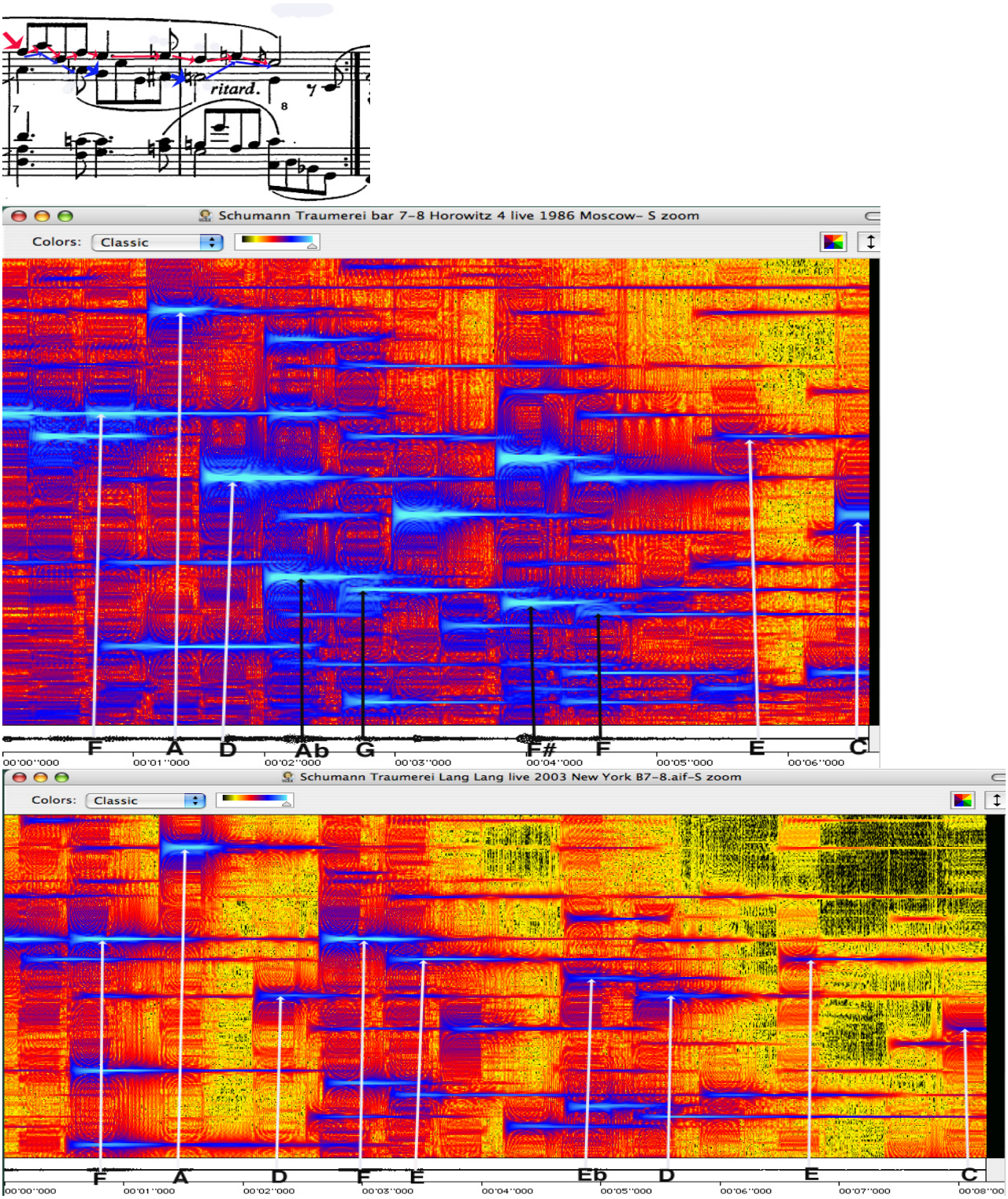


Figure 5.15/a. Robert Schumann *Träumerei*, Measure 7-8; Vladimir Horowitz 1986 live, Moscow; Lang-Lang 2003 live, New York. **Score: Blue markers** -inner voice emphasis (Horowitz). **Red markers** - upper voice emphasis (other performers)**. Spectrogram: White markers** – upper voice entrances, **Black markers –** inner voice entrances, emphasis and harmonic relationships.

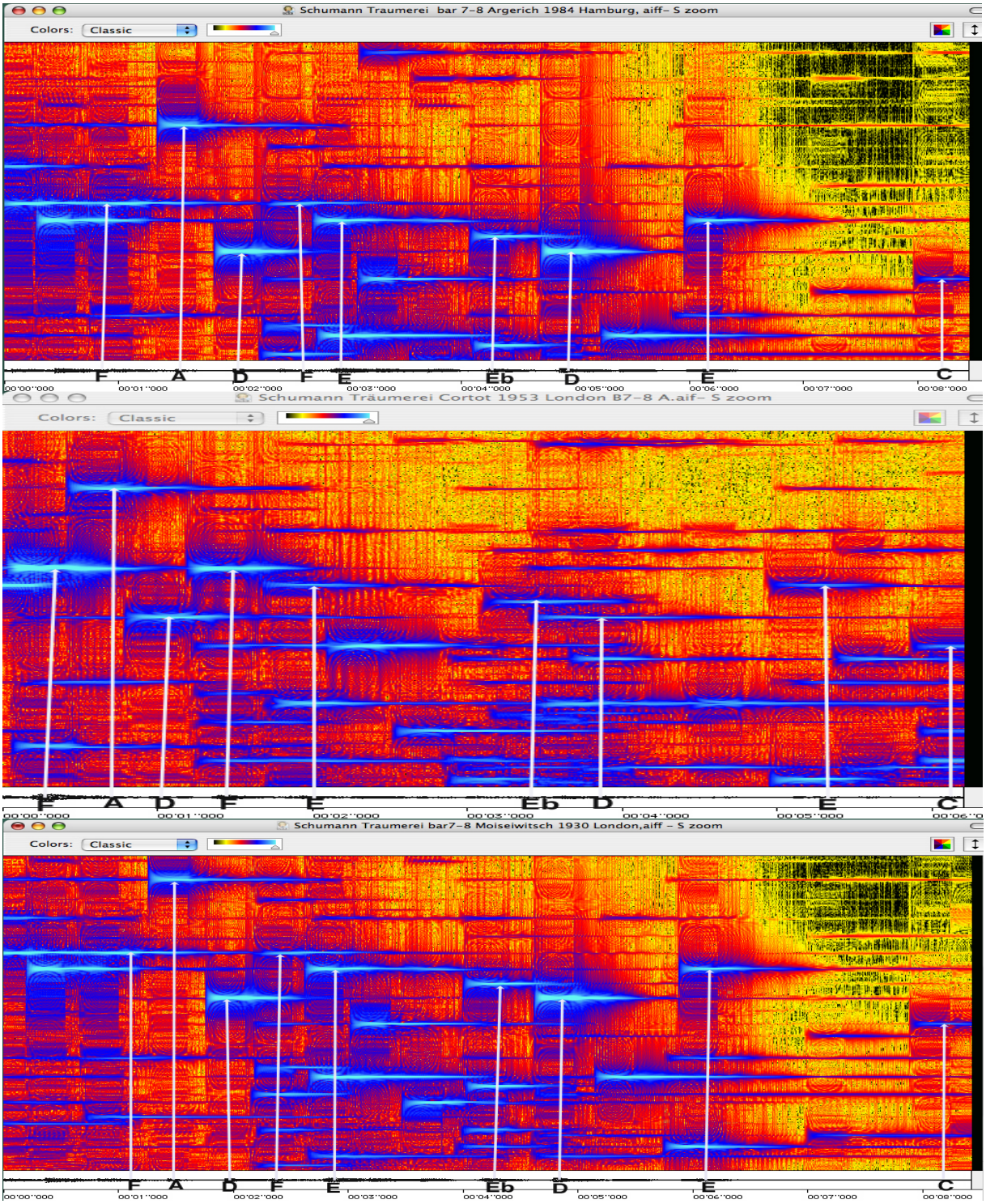


Figure 5.15/b. Spectrogram: Robert Schumann *Träumerei*, Measure 7-8; Martha Argerich, 1984, Alfred Cortot, 1953, and Benno Moiseiwitsch, 1930. **White markers** – upper voice entrances, emphasis and harmonic relationships. **Black markers –** inner voice entrances, emphasis and harmonic relationships.

Artist	Date/ Place	Studio/ Live	Duration bar 7-8 Min.s.ms
Horowitz	**1986 Moscow**	Live	00’08”494
Lang-Lang	2003 Carnegie	Live	00’10”986
Argerich	1984 Hamburg	Studio	00’10”896
Cortot	1953 London	Studio	00’08”673
Moiseiwitsch	1930 London	Studio	00’10”284

Table 5.6 Robert Schumann *Träumerei.* Measures 7-8: Comparative timings of durations. Performances by: Vladimir Horowitz, Lang-Lang, Martha Argerich, Alfred Cortot and Benno Moiseiwitsch.

The comparative performance analyses of Robert Schumann's *Träumerei* have identified the repeatedly consistent and creatively varied voice leadings in all eight of Horowitz's recordings. The discussion will now turn to the comparative performance analyses of Horowitz's voice leadings in Fryderyk Chopin's Marche Funèbre.

Fryderyk Chopin: Marche Funèbre from the Sonata in B flat minor op. 35.

The discussion of Chopin's Marche Funèbre will review the comparative performance analyses of Horowitz's voice leadings in his three performances (1950, 1962 and 1978) and the comparative analyses between his 1978 performance with those of Shura Cherkassky, Marc Andre Hamelin, Martha Argerich and Artur Rubinstein. The latter four pianists were selected for cross reference from comparatively analyzed performances of the *Marche Funèbre* by thirteen celebrated pianists

A recording by one or more of the other nine pianists will be referred to when required.

The discussion will confine itself to issues directly related to the consistent and creatively varied voice leadings that enter into identifying Horowitz's performing signature. The figures and tables below will be referred to as guidelines in the following contexts.

Figures 5.16, 5.17/a, 5.17/b and Tables 5.7, 5.8: Horowitz's three performances of the *Marche Funèbre*

Figures 5.18/a, 5.18/b, 5.19/a, 5.19/b and Table 5.9, 5.10: Horowitz's 1978 performance and those of the above pianists.

Horowitz: Repeated performances: Comparative overall durations and voicings.

The comparative overall durations and voice leadings of Horowitz's three performances of the Marche Funèbre provide insights into the varied, yet identifiable features of his signature voice. Horowitz slows down the tempo of each of these performances incrementally from his 1950 to 1962 and 1978 recordings, yet the durations of the opening section are equal (Figure 5.16 and Table 5.7).

The consistent inner voice-leading feature in all three performances is Horowitz's inner voice leadings in the Recapitulation section.

The significance of the relatively slow overall duration of Horowitz's 1978 performance and its relationship to his micro-timed inner voice leadings will be discussed in the contexts that follows. The voice leadings in the Marche Funèbre will, accordingly be reviewed in terms of their consistent and creatively varied features. References will be made to comparatively analyzed voice leadings in *Träumerei* that coincide with one or more in the present context.

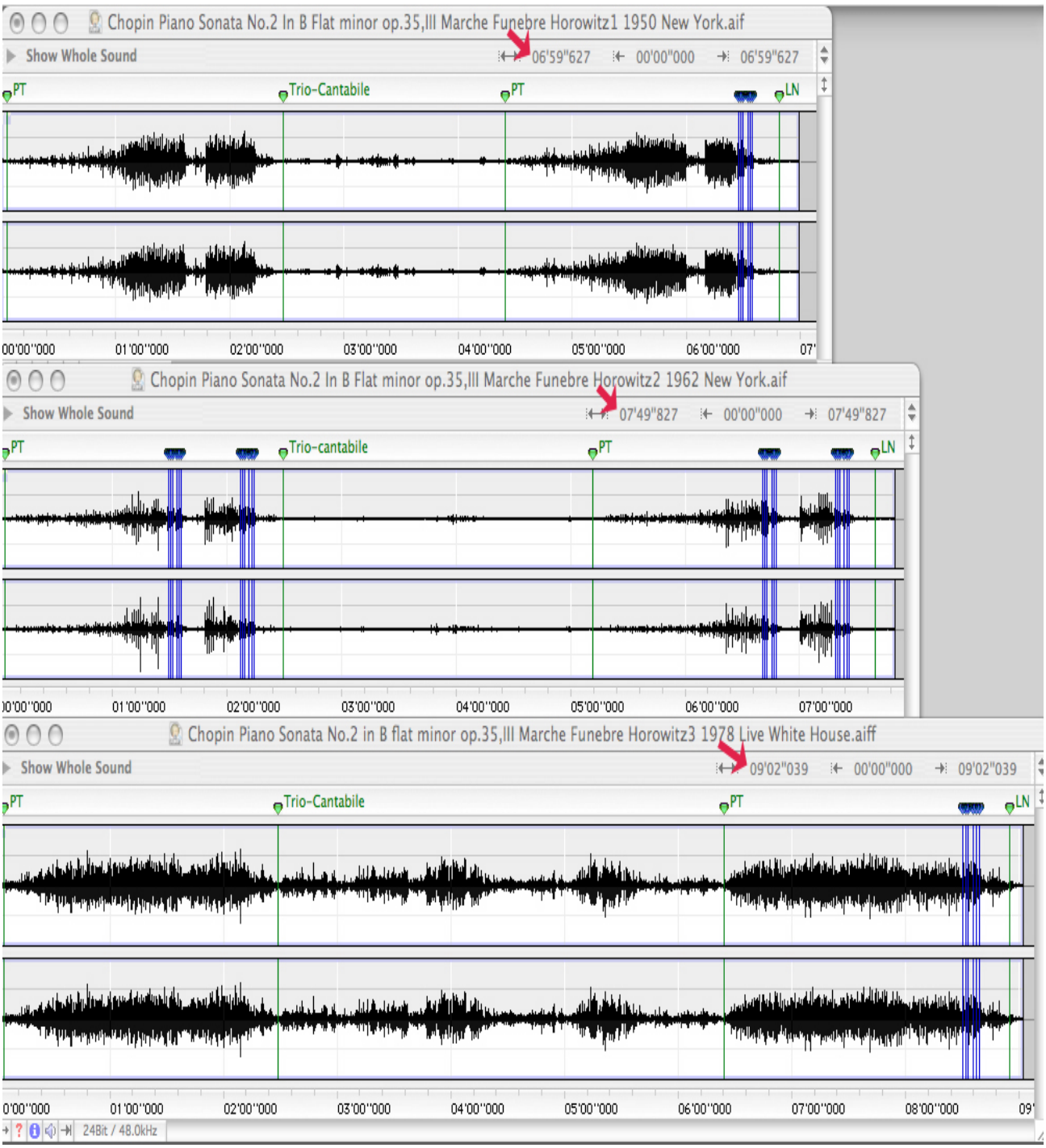


Figure 5.16. Amplitude Timeline of three performances (1950,1962,1978) by Vladimir Horowitz of Fryderyk Chopin's *Marche Funèbre* from Piano Sonata No.2 in B flat minor op.35.
Green Markers: PT- Principal Theme, Trio-Cantabile, LN-last notes entrance.
Blue Markers: inner voice entrances. **Red markers:** overall timing duration.(Min.s.ms.)

Date Place	Live Studio	Overall Duration Min.s.ms	Opening	Trio-Cantabile	Recapitulation
1950 NY	Studio	06’59”627	02’27”858	01’57”000	02’34”286
1962 NY	Studio	07’49”827	02’28”769	02’42”441	02’38”613
1978 White House	Live	09’02”039	02’28”926	03’55”379	02’38”997

Table 5.7. Comparative timings of overall durations and durations of main structural sections of Vladimir Horowitz performances of Fryderyk Chopin *Marche Funèbre* from Piano Sonata No.2 in B flat minor op.35.

The Traditional View: A Formal March

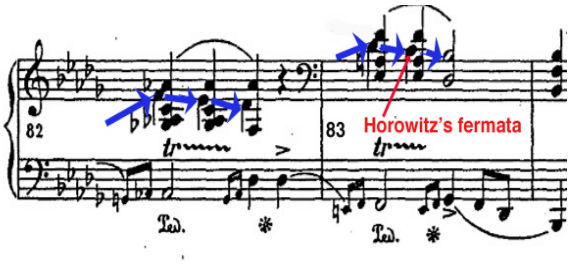
To begin with Fryderyk Chopin's *Marche Funèbre* has traditionally been performed as a formal march in the spirit of a parting tribute to a member of the royal family, a president, military hero or dignitary in any field of social interest. Whether the tempo is quick or slow, the beat will suggest marching feet that culminate in four rapid trills: two in the opening section and two in the Recapitulation. The repeated trill is traditionally performed as a simulated drum roll that is clearly intended to bring up images of uniformed marchers on parade. It comes, therefore as no surprise that a pianist is unlikely to question the drum roll effect.

Horowitz does, however, question the sanctity of the drum roll effect and with it the underlying assumption that a formal march is the only way to go with Chopin's Marche Funèbre: that a march is designed to express our sadness at the loss of a person who is no longer with us. The voice leadings Horowitz employs in his three performances of the March Funèbre will introduce his alternative to traditional practice.

Measures 82-83: From drum roll to a song of sorrow.

Horowitz's performances of the trill offer the most tangible distinctions between his perception of the *Funeral March* and that of the other pianists. In measures 82-83 of his 1950 performance he overturns traditional expectations by distancing the drum roll effect in favor of inner voice leadings (Figures 5.17/a and 5.17/b). In his 1962 recording the inner voice leadings can be seen and heard as dominant and creatively varied in all of the four repetitions of the trill. In his 1978 recording he holds back on emphasizing the

inner voice leadings until the final repeat in measures 82-83. He then adds a fermata to the penultimate note(C) of the sequence. The fermata is micro- timed to a) lengthen C by one second and b) measures 82-83 to an overall duration that is three seconds slower than his earlier performances (Table 5.8).



As in Träumerei Horowitz succeeds in transforming a seemingly insignificant sequence of inner voice lines into a series of novel musical experiences.

***Summary comments**:*

Horowitz's varied timings of these voice leadings illustrate his outstanding ability to creatively alter the "smaller details" of a complex piece of music independent of time or context (Chapter 4). These expressively directed and micro-timed distinctions are shown in the spectrographic representations (Figure 5.17b). The markers point out the durations of each note in the inner voice line as well as the harmonic resonances that Horowitz employed to keep the underlying drum roll effect at a distance.

Horowitz's single note fermata summarizes the atmosphere of personal sorrow suggested by the slow tempo and *portamento (singing)* qualities of his *voice* leadings: qualities that quietly hum their sense of grief rather than quickstep it to the beat of a march.

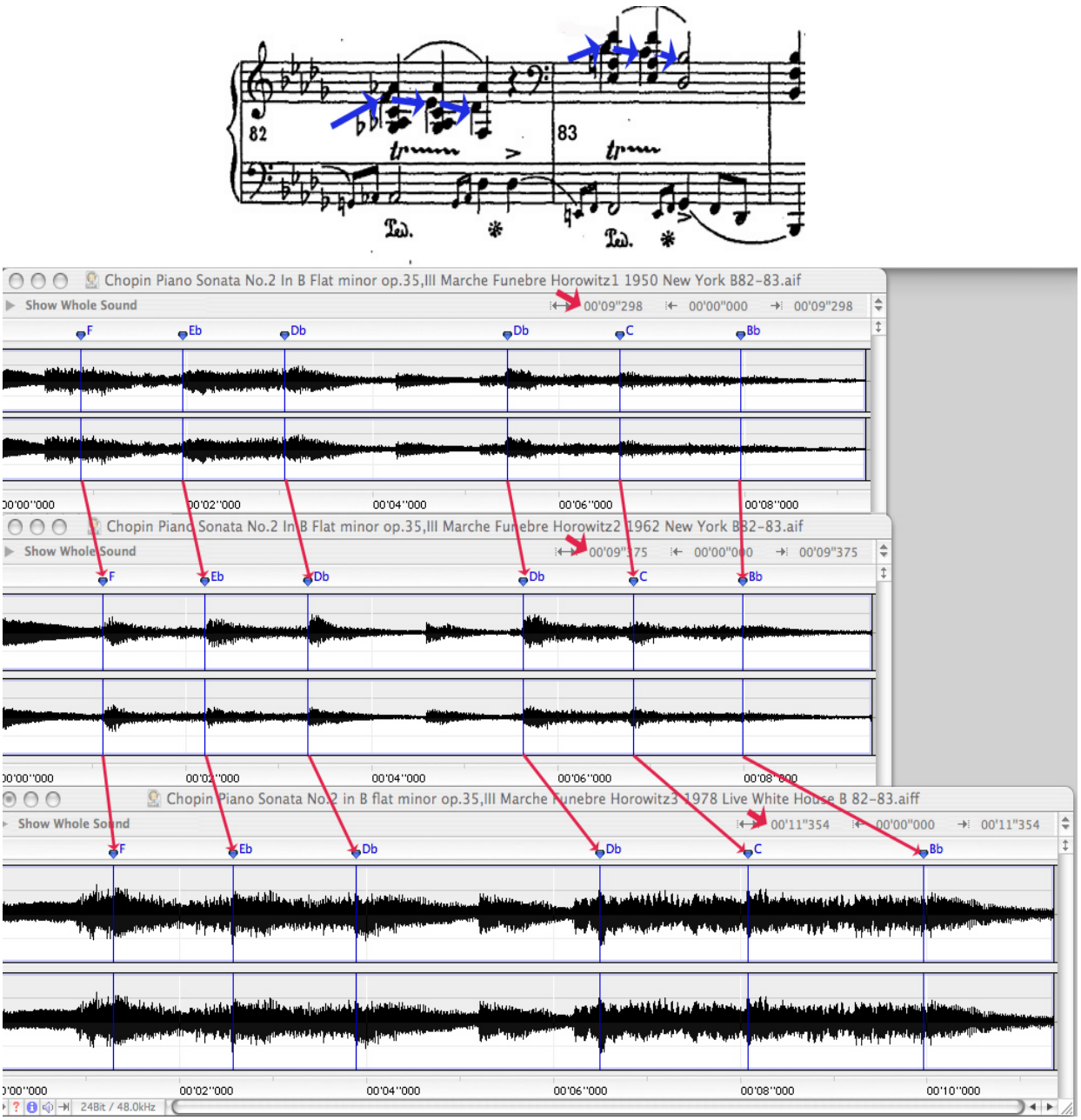


Figure 5.17/a Fryderyk Chopin, *Marche Funèbre* Measure 82-83.Vladimir Horowitz 1950, 1962, and 1978. **Score: blue markers** -inner voice emphasis. **Amplitude Timeline: blue markers -** inner voice entrances. **Red markers between graphs:** timing deviations. **Red markers:** overall timing duration of the excerpt (Min.s.ms).

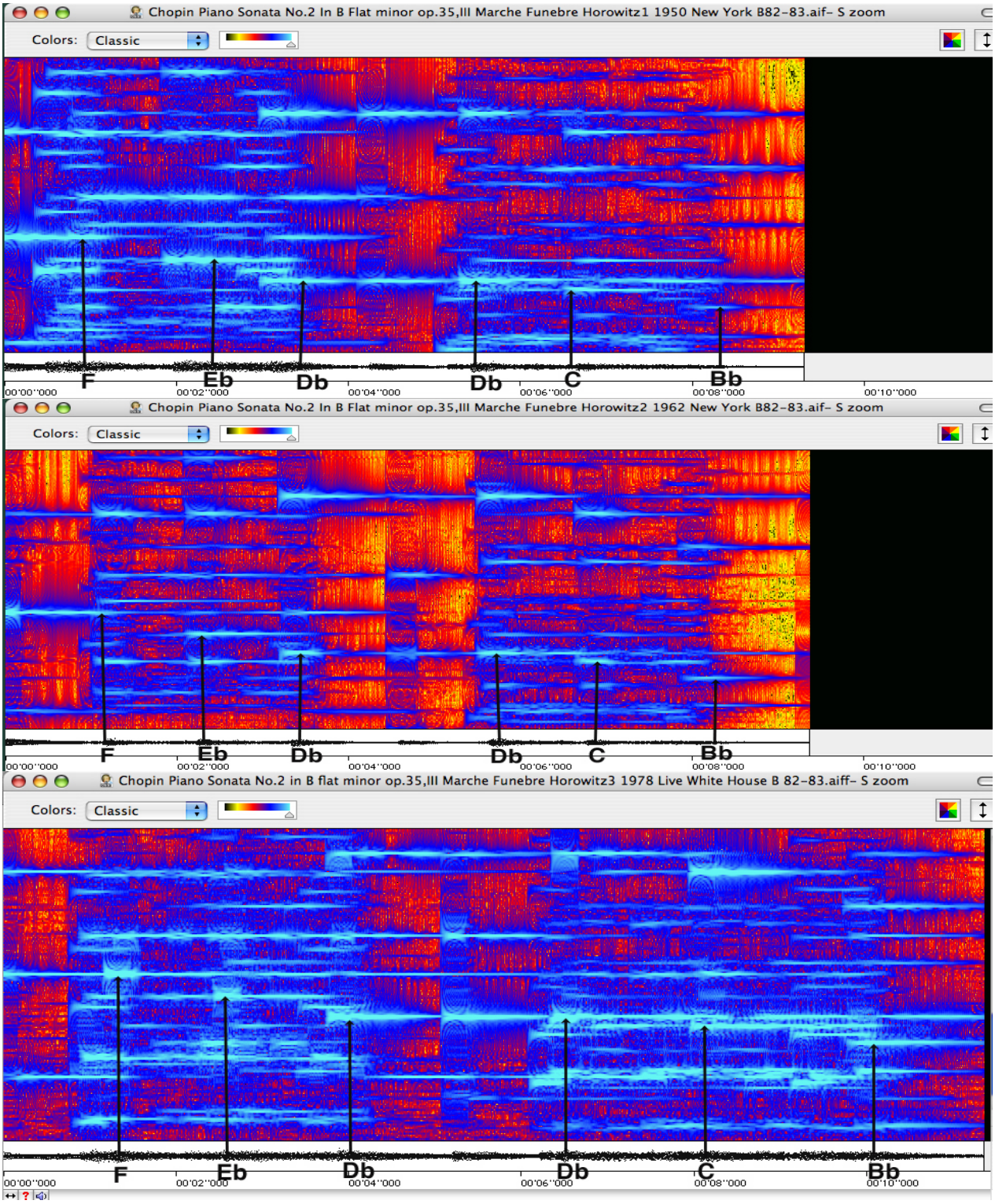


Figure 5.17/b Spectrograms : Fryderyk Chopin,*Marche Funèbre* from Piano Sonata No.2. in B flat minor op.35. Measure 82-83.Vladimir Horowitz,1950,1962,1978. **Black markers:** inner voice entrances, emphasis and harmonic relationships

Date & Place	Live Studio	Overall Duration Bar 82-83 Min.s.ms.	Duration C–Bb Bar 83 Min.s.ms.
1950 NY	Studio	00’09”298	00’01”363
1962 NY	Studio	00’09”375	00’01”222
1987 White House	Live	00’12”873	00’01”984

Table 5.8. Comparative timings of overall durations of Measure 82-83 and durations of note-to-note (C-Bb) of Vladimir Horowitz performances of Fryderyk Chopin *Marche Funèbre* from Piano Sonata No.2 in B flat minor op.35.

The discussion now turns from the comparative analyses of Horowitz's three performances of Chopin's Funeral March in comparisons with the same work by four pianists selected from the recordings of the thirteen pianists comparatively analyzed for the thesis study. These introductory remarks will focus on a discussion of the wide tempo differences in the performances of all 13 pianists (Table 5.9). The performers maintained a strict tempo throughout the march sections from beat to beat. Tempo flexibility was confined to the Andante Cantabile of the middle section. Here every performer applied a singing tone to the musical line that resulted in widely varied tempo distinctions between their overall timings. What is most interesting is that with exception of Horowitz all appeared to be caught up in the solemnity of the Funeral March and the traditional performance practice of emphasizing the drum-roll.

None of the 13 pianists explored other less evident options that were provided by the score, (see complete set of spectrographic representation of measure 82-83 in Appendix B). The four chosen as examples of the above assertion were Chercassky and Rubinstein, Horowitz's most celebrated colleagues and the two equally celebrated contemporary pianists, Hamlin and Argerich.

Pianists	Date & Place	Live or Studio	Overall Durations Min.s.ms.	Opening Bars 1-30	Trio-Cantabile Bar 31-55	Recapitulation Bars 56-85
Cortot	1953 London	Studio	05’41”547	01’58”831	01’39”486	02’03”231
Rachmaninov	1930 NY	Studio	06’08”827	02’06”267	01’52”196	02’10”562
Friedman	1927 London	Studio	06’10”640	01’59”963	02’01”257	02’10”716
Cortot	1933 London	Studio	06’25”534	02’15”973	01’53”086	02’16”476
Pogorelich	1981 Hamburg	Studio	06’32”676	02’17”217	02’02”557	02’14”662
Horowitz	1950 NY	Studio	06’59”627	02’27”858	01’57”000	02’34”286
Lortie	2009 Suffolk UK	Studio	07’07”991	02’16”503	02’35”933	02’06”042
Hamelin	2008 London	Studio	07’25”865	02’38”310	02’07”686	02’41”428
Horowitz	1962 NY	Studio	07’49”827	02’28”769	02’42”441	02’38”613
Pollini	1984 Hamburg	Studio	08’23”800	02’19”562	03’44”003	02’20”235
Argerich	1975 Munchen	Studio	08’34”147	02’09”241	04’06”041	02’18”300
Rubinstein	1961 NY	Studio	08’59”000	03’00”024	02’48”882	03’10”682
Horowitz	1978 White House	Live	09’02”039	02’28”926	03’55”379	02’38”997
Uchida	1987 London	Studio	09’17”334	02’33”049	03’58”663	02’45”622
Grimaud	2004 Berlin	Studio	09’25”000	02’30”642	04’09”315	02’45”114
Cherkassky	1982 Belfast	Live	09’54”827	02’48”975	04’11”384	02’55”162

Table 5.9 Comparative timings of overall durations from the quickest to the slowest; and durations of main structural sections of performances of Fryderyk Chopin *Marche Funèbre* from Piano Sonata No.2 in B flat minor op.35

Comparative performance analyses: Horowitz, Cherkassky, Rubinstein, Hamelin and Argerich.

Amplitude timeline representations (Figures 5.18/a and 5.18/b)

The amplitude time line representations show the comparative durations and dynamic intensities between Horowitz's 1978 White House performance and those of the four other pianists. The individual differences are widely varied in both their overall and internal contexts. There is, for example an overall difference of approximately two minutes between the slowest and quickest duration. On the other hand, the slowest to quickest durations of the opening measures (1-30) differ by less than one minute. The Trio Cantabile (31-55) shows an average difference of approximately two minutes.

The widely varied distinctions in both overall and internal timings point out individual perceptions of the *March Funèbre.* (Tables 5.9 and 5.10), Yet as well conceived as these performances by great artists were, Shura Cherkassky was the only one who reached beyond traditional practice to simulate a church bell effect in the Recapitulation (Figure 15.18/a) The ringing durations of the bell are represented by the series of red vertical lines.

Pianists	Date Place	Live Studio	Overall Duration Min.s. ms.	Opening Bar 1-30 Min.s. ms	Trio-Cantabile Bar 31-55 Min.s. ms	Duration Bar 82-83 Min.s.ms.	Recap. Bar 56-85 Min.s. ms
Horowitz	**1978 White House**	**Live**	**09'02"039**	**02'28"926**	**03'55"379**	00'12"873	**02'38"997**
Cherkassky	1982 Belfast	Live	09'54"827	02'48"975	04'11"384	00'12" 710	02'55"162
Hamelin	2008 London	Studio	07'25"867	02'38"310	02'07"686	00'11"651	02'41"428
Argerich	1975 Munich	Studio	08'34"147	02'09"241	04'06"041	00'09"764	02'18"300
Rubinstein	1961 NY	Studio	08'59"000	03'00"024	02'48"882	00'12"730	03'10"682

Table 5.10 Comparative timings of overall durations, durations of main structural sections durations of Measure 82-83 of performances of Fryderyk Chopin *Marche Funèbre* from Piano Sonata No.2 in B flat minor op.35 Horowitz, 1978, Cherkassky, 1982, Hamelin, 2008, Argerich 1975, and Rubinstein, 1961

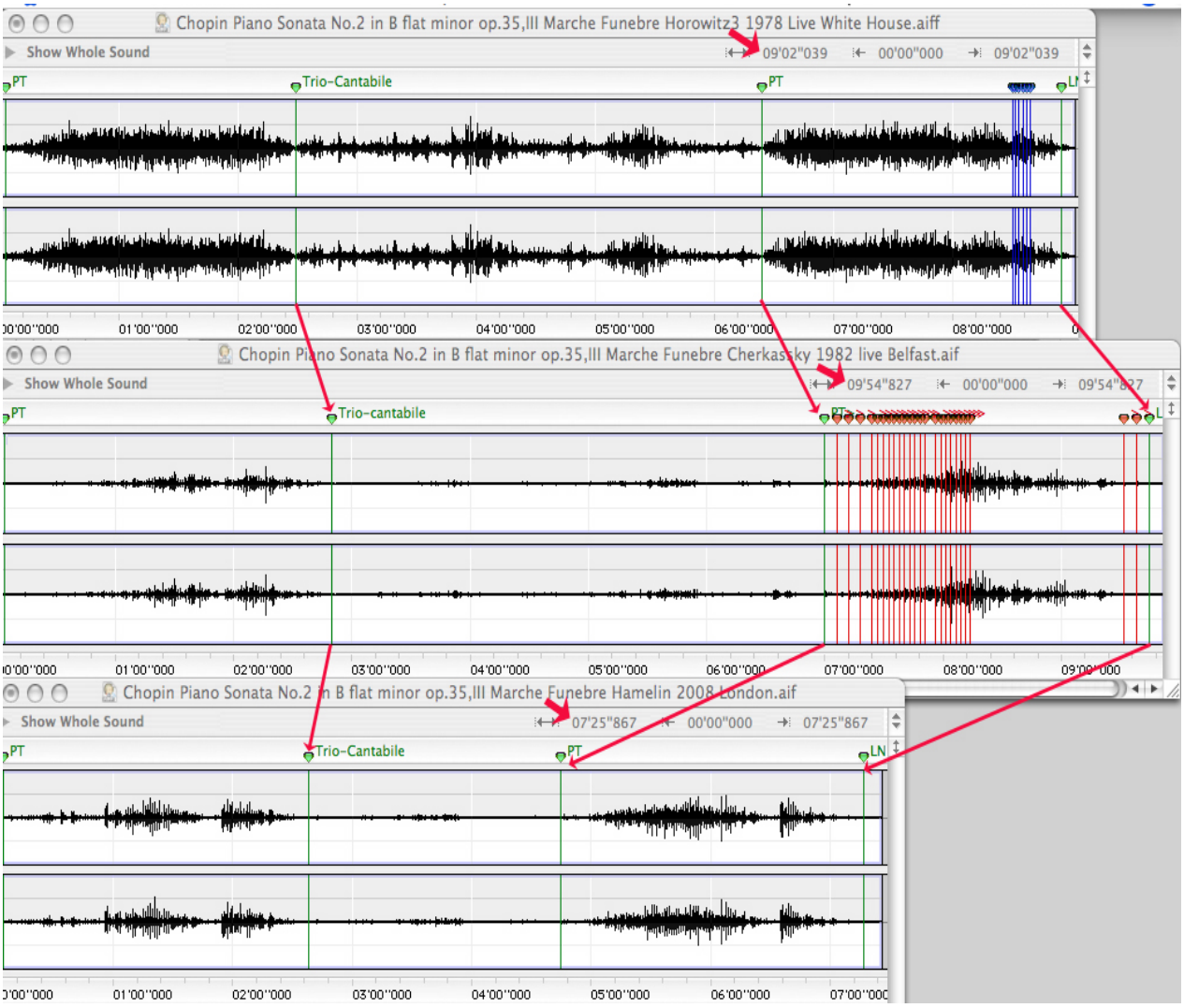


Figure 5.18/a. Amplitude Timeline: performances of Fryderyk Chopin *Marche Funèbre* from Piano Sonata No.2 in B flat minor op.35. Horowitz, 1978, Cherkassky, 1982, Hamelin, 2008
Green Markers: PT- Principal Theme, Trio-Cantabile, LN-last notes entrance.
Blue Markers: inner voice entrances. **Red markers >:** bell-like accents (Cherkassky)
Red markers (top) overall timing duration (Min.s. ms)
Red markers between graphs: timing deviations.

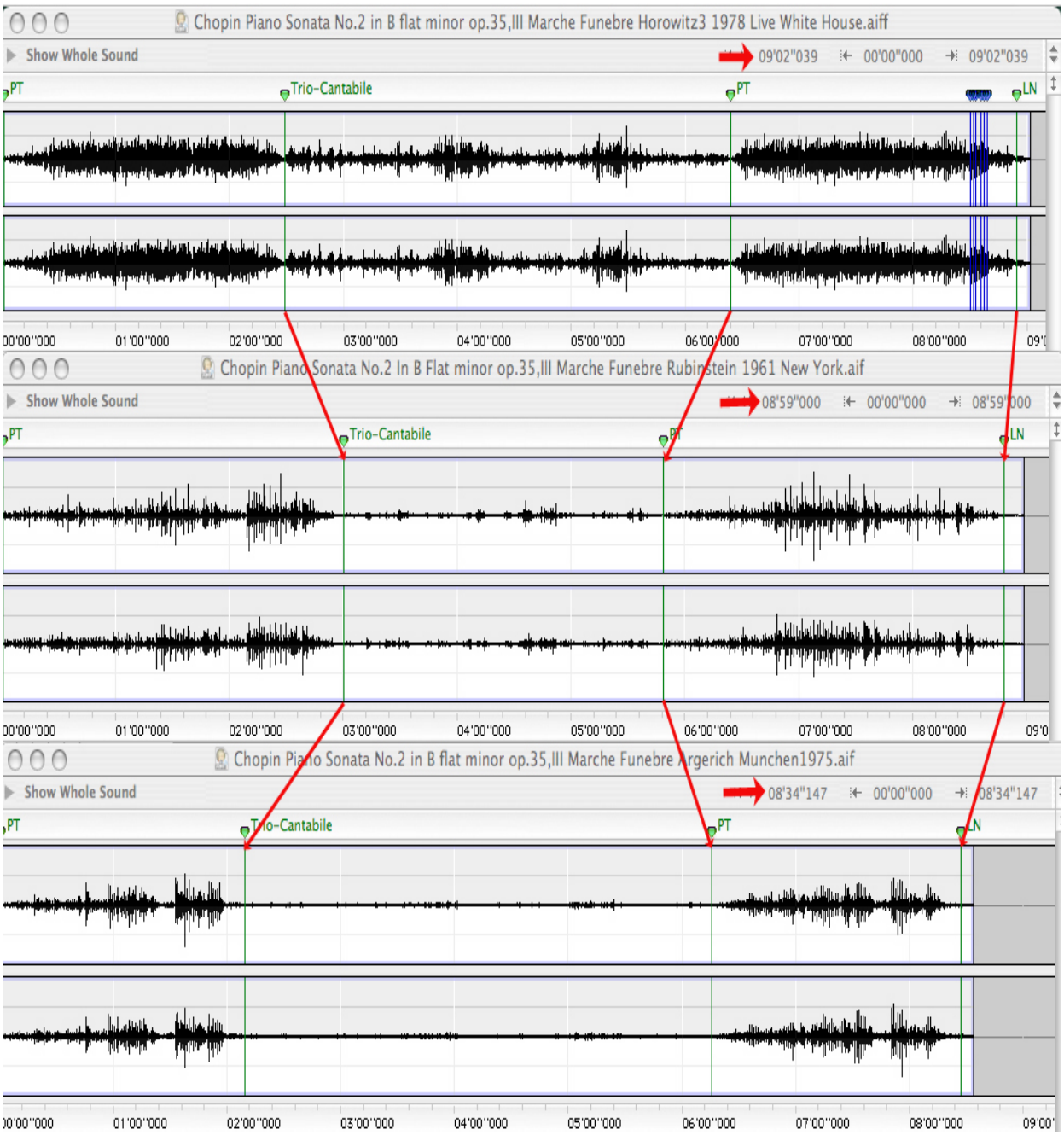


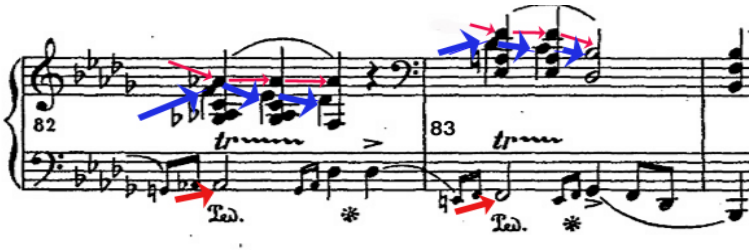
Figure 5.18/b. Amplitude Timeline: performances of Fryderyk Chopin *Marche Funèbre* from Piano Sonata No.2 in B flat minor op.35. Horowitz, 1978, Rubinstein, 1961, and Argerich 1975
Green Markers: PT- Principal Theme and Trio-Cantabile, LN-last notes entrance.
Blue Markers: inner voice entrances. **Red markers (top)** overall timing duration (Min.s. ms)
Red markers between graphs: timing deviations.

The discussion that follows concentrates on how Horowitz transformed the traditional emphasis of measures 82-83 from a simulated drum roll to an inner voice leading sequence that stands out as the predominant focus of attention. (**Figures 5.19/a, 5.19/b)**

Comparative Timings: voicing and the drum roll effect.

Horowitz's overall timing of these two measures is slower than that of the other pianists. Cherkassky, Rubinstein and Hamelin are progressively faster than Horowitz with Argerich as the quickest in that order (Table 5.10) .

The most significant differences however can be seen and heard in the drum roll (trill) effect of measures 82-83. In contrast to Horowitz's comparatively distant drum roll all the other pianists treated it as the most prominent feature of measures 82-83. All announced the entry of the simulated drum roll with a drumstick like attack on the first beat of measure 82 and again on the first beat of measure 83. The descending chords in the upper register were accordingly heard as an accompaniment to the drum roll.



Every pianist found it necessary to slow these two measures down from the otherwise strict beat of their march like tempos. The sudden pulling back of the tempo made it possible to create a convincing drum roll out of a rapidly moving trill. The drum roll effect was, as a consequence, the main reason for most pianists to slow down. Horowitz, as previously noted saw the need to slow down as an opportunity to introduce

an inner voice sequence that challenged the conventional emphasis on a simulated drum roll. The predominance of note-to-note inner voice sequencing in his performance of measures 82-83 is pointed out in Figure 5.19/a. In contrast, Cherkassky's emphasis on the drum roll effect in Figure 5.19/a is seen in the overriding harmonic resonances that envelop the sequencing of all voices above the two note (Ab and F) drum roll attacks in the bass register. These two bass register features clearly point out the dominating emphasis on simulated drum role in Cherkassky's performance. The lightened up blue note-to-note entrances of Horowitz's spectrographic representation of these two measures override the predominance of harmonic resonance in all the drum roll representations that were comparatively analyzed.

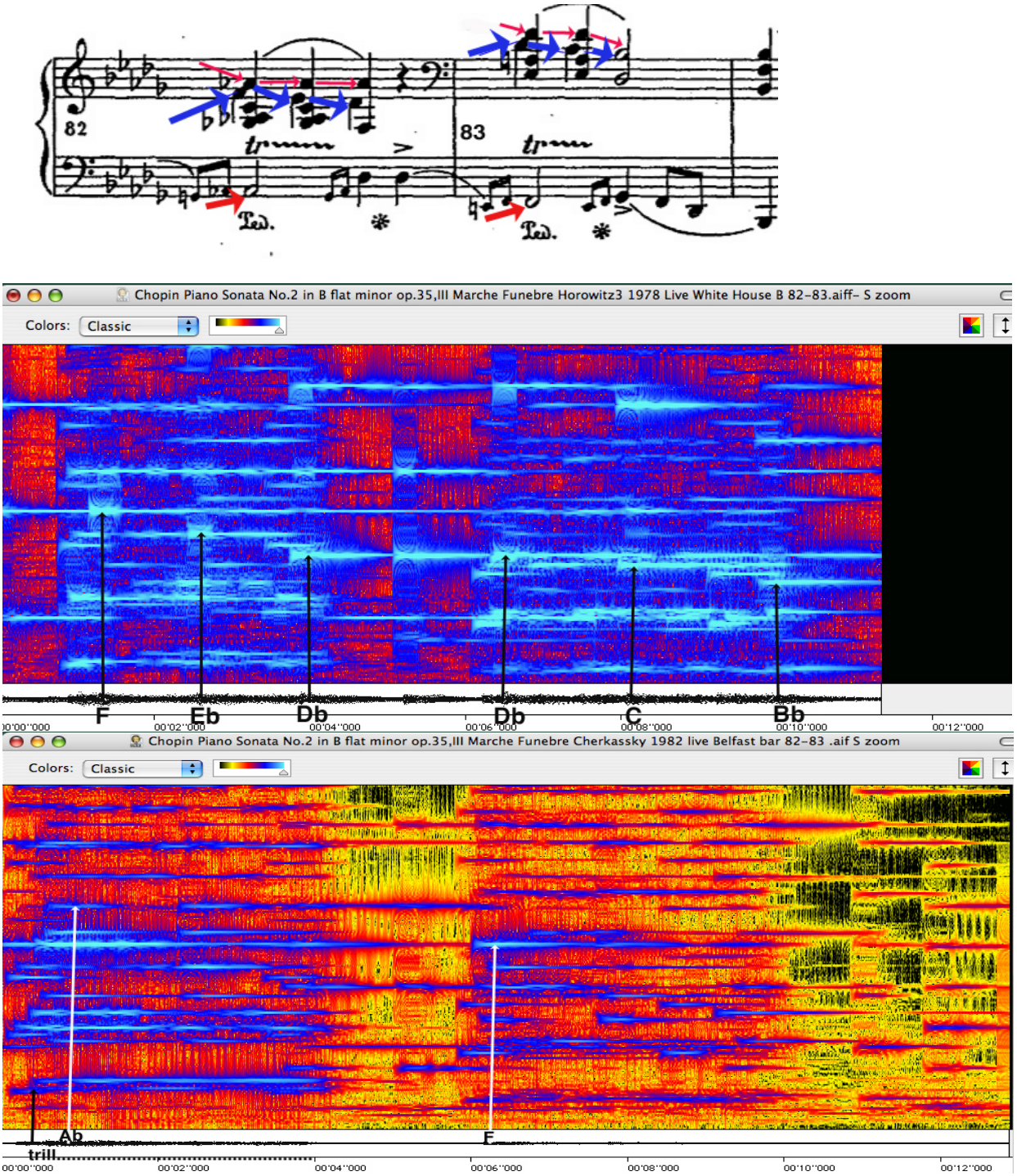


Figure 5.19/a. Fryderyk Chopin, *Marche Funèbre.* Measure 82-83. Horowitz, 1978, and Cherkassky, 1982. **Score: Blue markers** -inner voice emphasis (Horowitz). **Red markers** - upper voice and trill emphasis of other performers). **Spectrogram - black markers:** inner voice and trill entrances emphasis and harmonic relationships. **White markers:** upper voice entrances, emphasis and harmonic relationships.

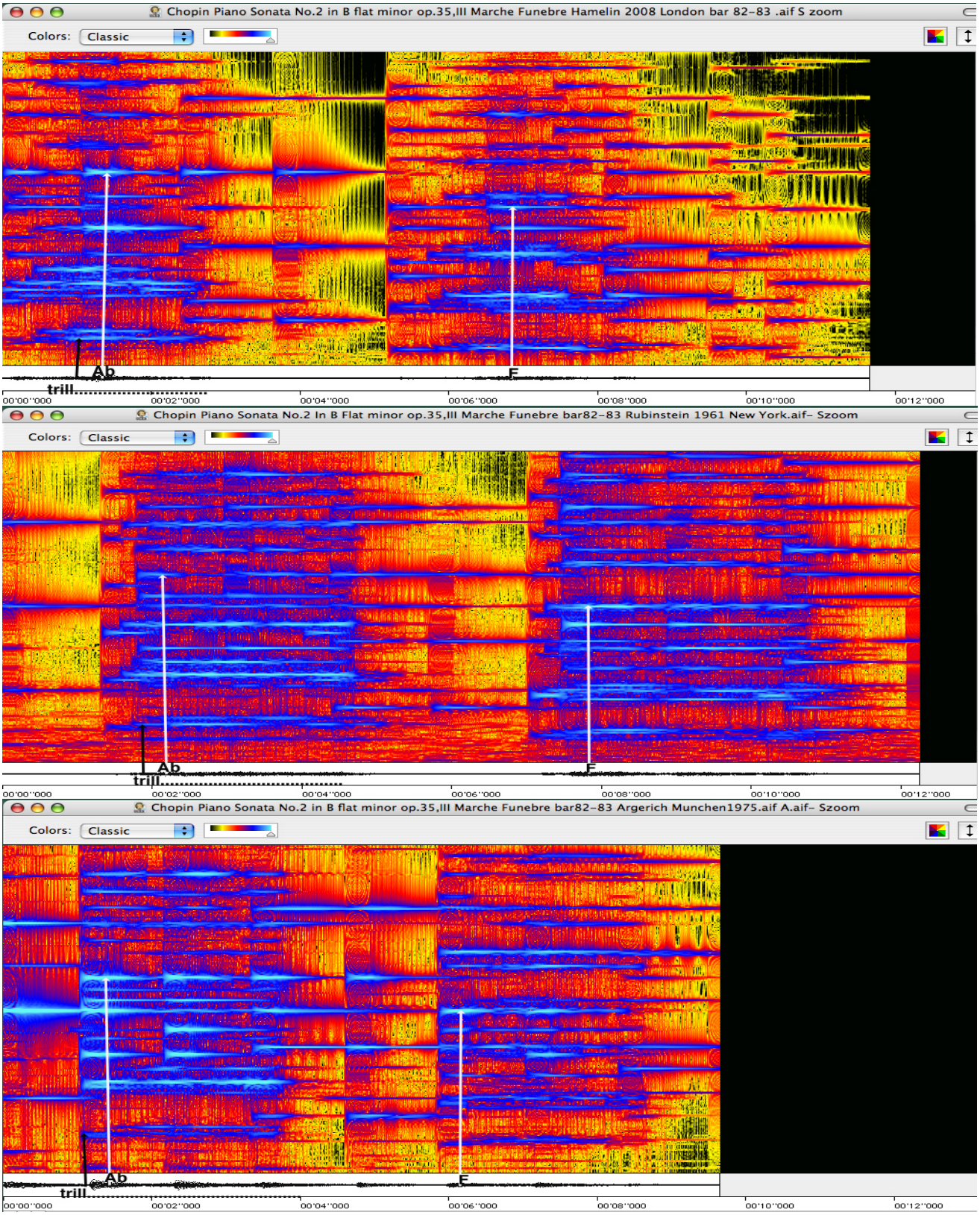


Figure 5.19/b. Spectrogram: Fryderyk Chopin, *Marche Funèbre* Measure 82-83. Mark-Andre Hamelin, 2008, Artur Rubinstein, 1961, and Martha Argerich, 1975.

Summary comments:

Horowitz's creatively varied voice leadings in the *Marche Funèbre* exemplify his legendary status as a creative artist in the spirit of the great composer pianists (Dubal, 2004).His slow paced tempo, subtly timed voice leadings and singing tone combined to transform the march into a profoundly moving personal experience: an experience that he shared with his listeners. (Cherkassky's church bell effect is an addition to the score. It is atypical in the present context where creative variability is achieved without any deviation from the given pitch). With the possible exception of Shura Cherkassky's church bell effect in the Recapitulation ((Figure 5.18/a) not one of the thirteen other major pianists came close to communicating a comparable personal vision of Chopin's Marche Funèbre. (Table 5.9) Horowitz' s shift of expressive focus stands out as a one of a kind musical experience. This remains so even when compared with the otherwise beautifully articulated performances of the march by great pianists.

The comparative performance analyses of Robert Schumann's *Träumerei* and Fryderyk Chopin's *Marche Funèbre* have identified the repeatedly consistent and creatively varied voice leadings in Horowitz's recordings. The discussion will now move on from these two familiar works selected from the standard repertoire to three compositions selected from the Russian repertoire that he is most commonly identified with. The works chosen are repeated live performances. These in the following order are Sergei Rachmaninov's Prelude op. 32, no.12 in G# minor; his Polka de W.R. and Alexander Scriabin's Etude in C# minor op.2 .

Sergei Rachmaninov Prelude, op. 32, no.12 in G# minor.

Horowitz: Comparative analyses of his repeated performances.

The comparative analyses of Horowitz's voice leadings will focus on the following measures of Rachmaninov 's Prelude in g# minor op. 32, no. 12. The emphases will be on their consistency and variability over time.

1) Measures 35-39: Horowitz's aesthetically conceived and expressively directed micro-timing of arpeggiated chords with alternative voice leadings..
2) Measures 41-44: Horowitz's inner voice leadings, applications of harmonic resonance and creative variability.

The discussion will begin with references to his complete five performances.

Consistency and creative variability.

Figure 5.20: Amplitude timelines

Inner voice leadings are a consistent factor in all of Horowitz's five recordings despite his widely varied overall durations and amplitudes between performances. The timings, for example of the overall durations differ within a margin of 18 seconds while the main internal sections differ by a margin of ten seconds or less (Table 5.11).

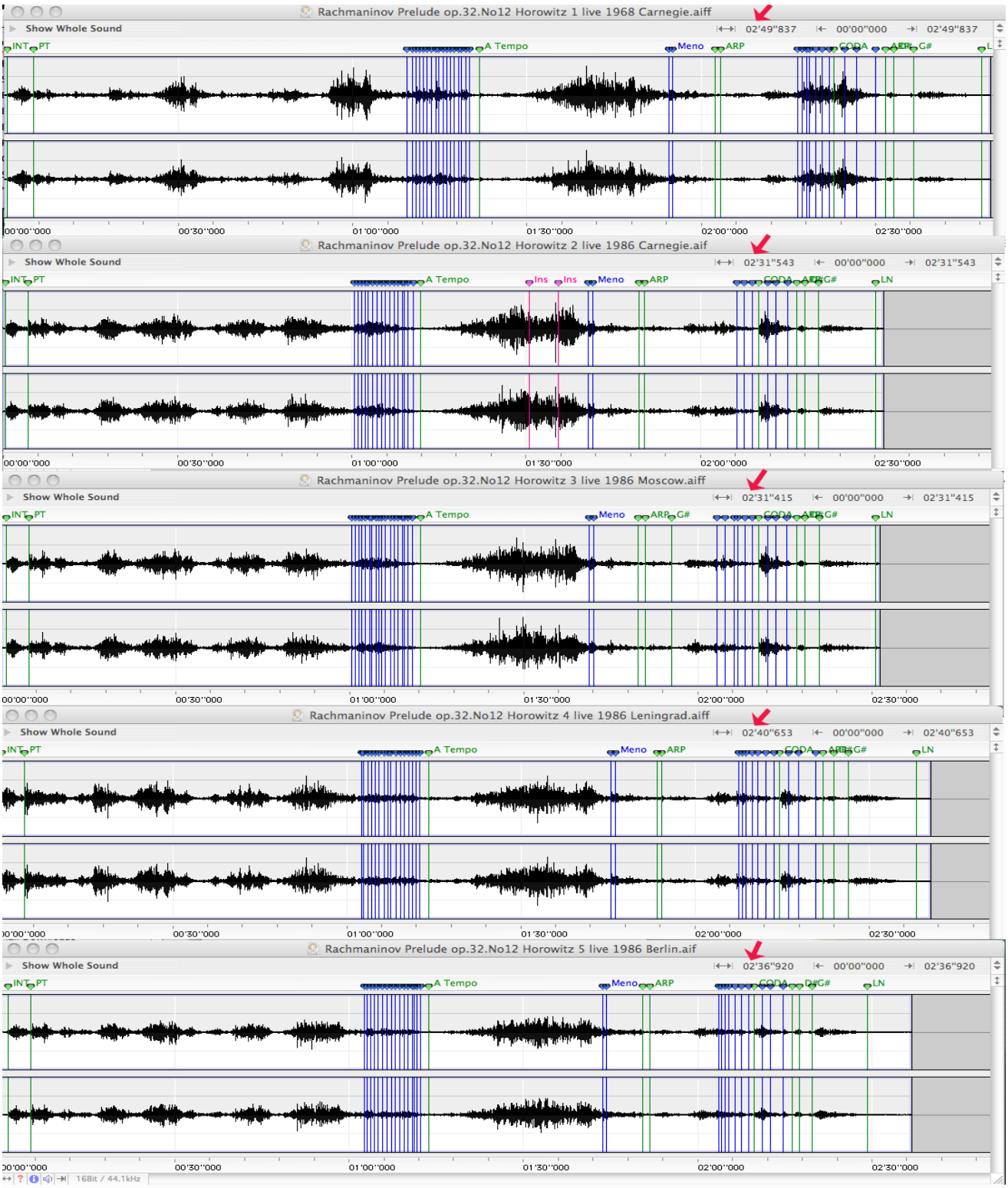


Figure 5.20 **Amplitude Timeline** of five performances (1968-1986) by Vladimir Horowitz of Sergei Rachmaninov's *Prelude in g-sharp minor op.32 No.12*.**Green Markers**: PT- Principal Theme, ARP- arpeggio, LN-last notes entrance. **Blue Markers:** inner voice entrances**.** **Red markers:** overall timing duration (min.s.ms.), Ins.-instability (Carnegie1986).

Date Place	Live Studio	Overall Duration Min.s.ms.	Opening Bar 1-23	A tempo Bar 24-35	Meno mosso Bar 36-48
1968 Carnegie NY	Live	02'49"837	01'21"269	00'33"022	00'53"191
1986 Carnegie NY	Live	02'31"543	01'11"382	00'29"858	00'48"840
1986 Moscow	Live	02'31"415	01'11"580	00'28"896	00'48"643
1986 Leningrad	Live	02'40"653	01'13"755	00'32"033	00'51"806
1986 Berlin	Live	02'36"920	01'12"568	00'30"649	00'44"886

Table 5.11 Comparative timings of overall durations and durations of main structural sections of Vladimir Horowitz performances of Sergei Rachmaninov *Prelude in g-sharp minor op.32 No.12*.

A radical (poetic) vision of voice leadings - Measures 35-39 and 41-44:

Horowitz's five repeated performances of his voice leadings in measures 35-39 and 41-44 bring a vision to Rachmaninov's g# minor prelude that can best be described as poetic. In each performance he transforms the ornamental flourishes expected of an arpeggio into an aesthetically gratifying summary of the prelude as a whole. For example the transformation of key harmonic points of rest into melodic lines at measure 37 and 43 within durations between performances of less than two seconds (Table 5.12) .

Measures 35-39:

Horowitz opens the sequence with a *progressive* slowing down of the passage at the meno *mosso.* He continues by emphasizing the top note of every chord in the bass line. The result is a melodic sequence that is heard as an inner voice line over an accompanying bass chord. The sequence continues through to the G# sharp chord of measure 37. At the arpeggio (Figure 5.21/a, 5.21/b) Horowitz shifts the voice line to C #, the lowest bass note in the passage. The voice line then moves upward note by note to its peak on D# in the soprano register. The ensuing cantabile soprano line is heard as a continuation of the bass line melody. It is simultaneously experienced as an echoed conversation between voice leadings. The overall durations of the two measures differ by less than three seconds (Table 5.12).

The consequent nuanced pulling of the beat signifies a mode of creative variability that is characteristic of Horowitz's performances across the repertoire. Most significant is his aesthetically conceived vision of Rachmaninov's prelude in g# minor. No other pianist, including the composer, approached the prelude from this perspective.

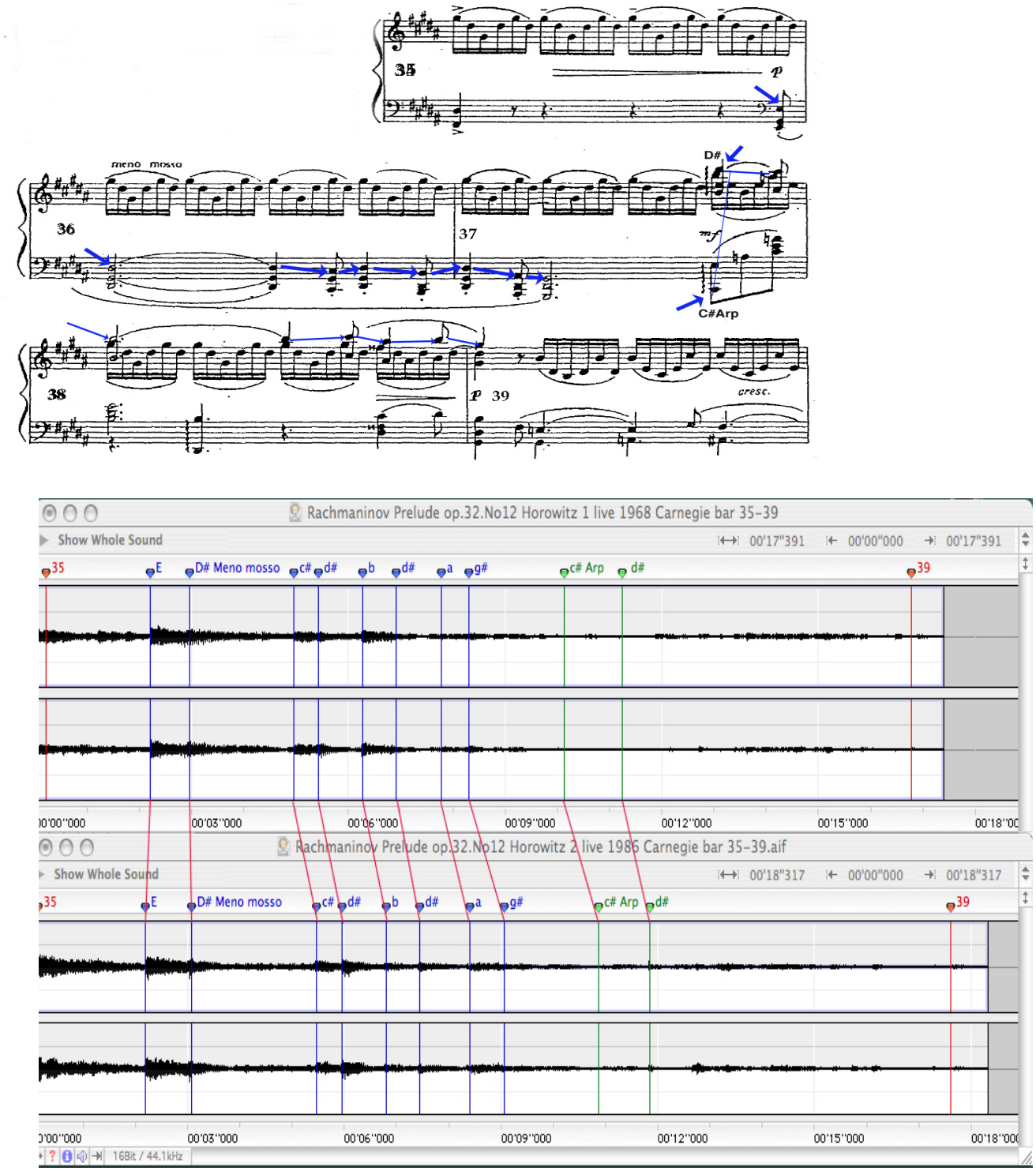


Figure 5.21/a Sergei Rachmaninov Prelude op.32.No.12. Measure 35-39.Vladimir Horowitz 1968,1986. **Score: blue markers** -inner voice emphasis**, green marker-**Arp.(Arpeggio-broken chord) entrance. **Amplitude Timeline: blue markers -** inner voices note-to-note entrances, **green marker-**Arp.Arpeggio-broken chord) entrances (lowest to highest note c#-d#). **Red markers between graphs:** timing deviations

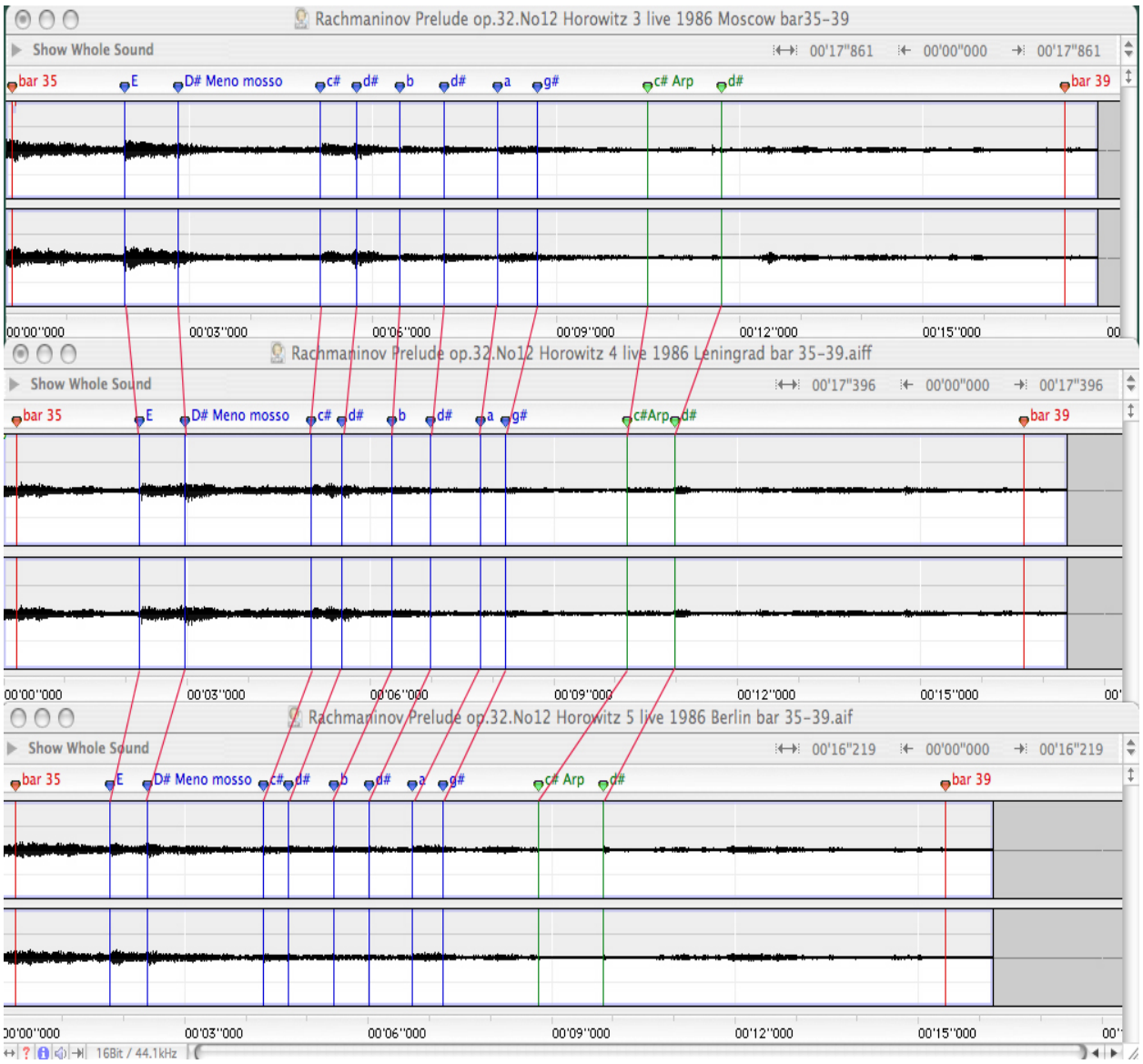


Figure 5.21/b Sergei Rachmaninov Prelude op.32.No.12. Measure 35-39.Vladimir Horowitz 1986 Moscow, Leningrad, Berlin. **Amplitude Timeline: blue markers -**inner voices note-to-note entrances, **green marker –** Arp.(Arppegio-broken chord) entrances (lowest to highest note c#-d#). **Red markers between graphs:** timing deviations .

Vladimir Horowitz Date Place	Live Studio	Duration (Arpeggio-broken chord) entrances lowest to highest note c#-d#. Bar 37 Min.s.ms.	Durations Bar 41-44
1968 Carnegie NY	Live	00’01”148	00’20”753
1986 Carnegie NY	Live	00’01”048	00’18”683
1986 Moscow	Live	00’01”248	00’18”708
1986 Leningrad	Live	00’01”223	00’20”005
1986 Berlin	Live	00’01”123	00’17”186

Table 5.12 Comparative timings of durations of the broken chord (beat 4) measure 37 and Measure 41-44 of Vladimir Horowitz performances of Sergei Rachmaninov *Prelude in g-sharp minor op.32 No.12*.

Measures 41-44:

The discussion that follows shows how Horowitz brought an additional conversational perspective to Rachmaninov's notated voice leadings in measures 41-44 (Figure 5.22/a and 5.22/b). He did so by establishing a series of unbroken melodic exchanges between three different voice lines. The connecting links between the voices served to carry the entire passage to a key point of arrival in measure 44 of the prelude.

In his repeated performances of the *Prelude* Horowitz treated the notation as an opportunity to bring a novel perspective to focal points in the composition. For example, he micro timed and creatively the voice line entrances in the above passage and creatively varied their relationship the following notes and their surrounding harmonic resonance as moved upward through all pitch levels to the peak (f-p) in measure 43 before dissolving on the first beat (pp) of measure 44.

The consistent and creatively varied perspectives Horowitz brought to Rachmaninov's g# minor Prelude is a significant clue to his signature voice. The fact that he was able to do so over a period of 22 years without compromising the essential features of the work at hand is a tribute to his creative ingenuity. The same can be said for his Träumerei 1965 - to 1987 and Marche Funèbre 1950-1978) performances.

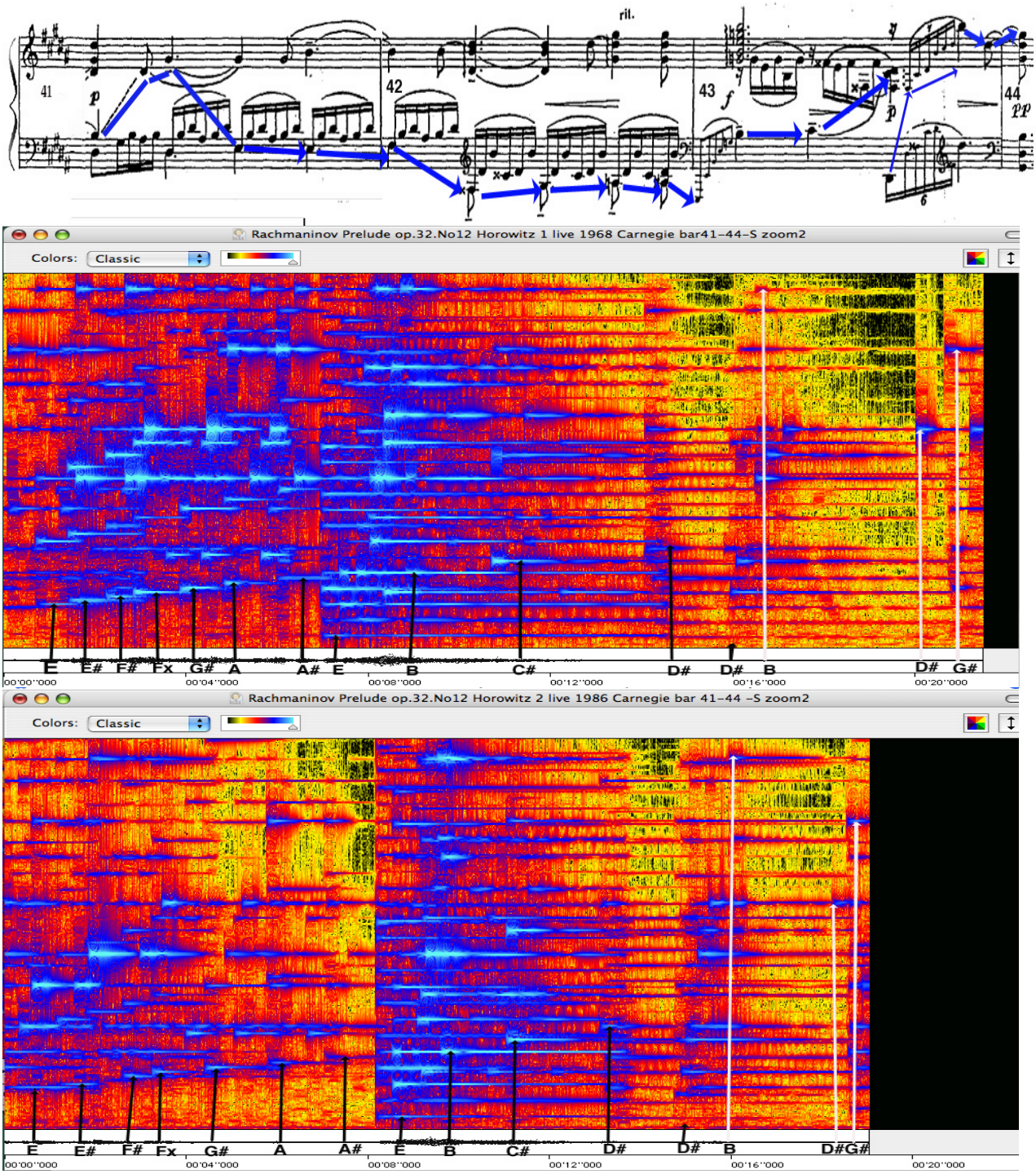


Figure 5.22/a Sergei Rachmaninov Prelude op.32.No.12. Measure 41-44. Vladimir Horowitz 1968,1986. **Score: blue markers** - voice emphasis**, Spectrogram: black markers:** lower voice entrances, emphasis and harmonic relationships. **White markers:** upper voice entrances.

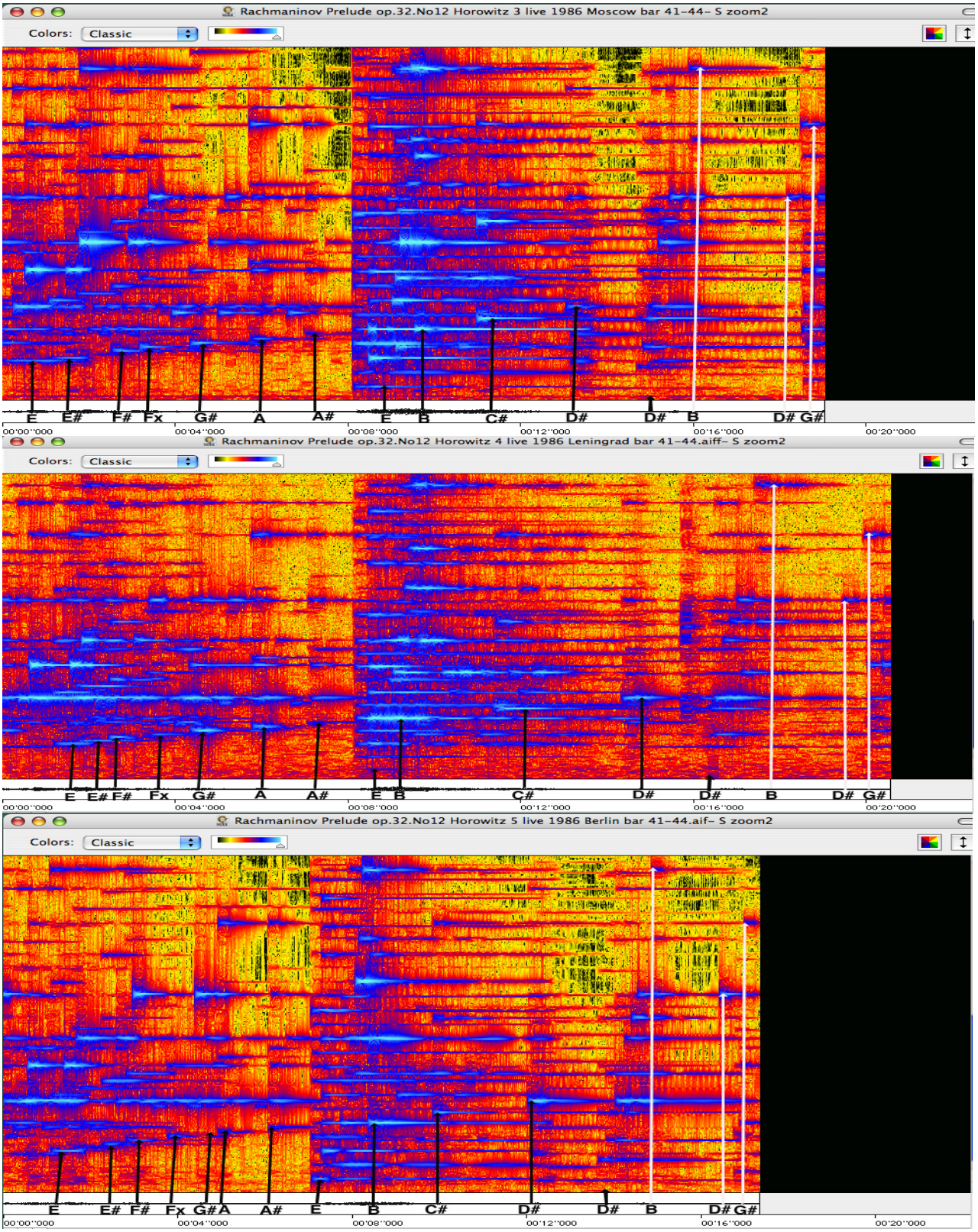


Figure 5.22/b – Spectrogram - Sergei Rachmaninov Prelude op.32.No.12. Measure 41-44. Vladimir Horowitz 1986 Moscow, Leningrad, Berlin.

Horowitz's overall and durational timings of measure's 41-44 are varied in all five of his performances (Table 5.12). His internal durations in particular are notable for the conversational exchanges between his cantabile line in the *soprano* voice and his strongly defined voice leadings in the lower registers. In the process Horowitz reverses the route of a singing line that would normally build up in loudness from the notated p (*piano*) in measure 41 to a climax on the top note (B) of the first arpeggio of measure 43. Instead he has the voice-leading move the passage forward to a stress on E the lowest note of the arpeggio at the entrance of measure 43. He then continues upward to bring out the inner notes B and C# and D#, followed by the topmost soprano B. The arpeggio **(**Arp. Figure 5.22/a, Figure 5.22/b), at the opening of measure 43 thereby moves upward to a "poetically" expressive pause on B, the final beat of the measure.

The pause on the penultimate note B summarizes the passage with a surprise ("poetic") turn of phrase that endows the musical line with an emotive quality that is unmistakably Horowitzian. As the note B fades out one is left with a momentary impression that there is nothing more to say. The delay sets the stage for a return to full speed in the codetta that brings Rachmaninov's g# minor Prelude to a close. The surprise pause suggests that the g# chord that follows on the first beat of measure 44 is the end of the prelude.

Comparative Performance Analyses: Horowitz, Rachmaninov, Richter and Ashkenazy: Amplitude time-lines Durations and Voice Leadings.

The differences between each performer's overall time frame are significant. Relational differences between the timing and amplitude of "smaller details" were markedly distinct. Further aural analysis of the upper and lower voice parts showed

distinct relational variations between *agogics*, articulation, stress and rhythmic patterns (Figure 5.23).

For example, Richter's overall and internal timings are the most compressed in the study His represented amplitudes in turn are the most intense. The other comparative timeline representations show clear distinctions between Horowitz's performances and those of the three other great pianists. The distinctions are dramatically evident in the musical implications that come with Horowitz's conversion of harmonic points of reference to melodic lines.

Rachmaninov. Richter and Ashkenazy focused on the soprano melody and confined their more discrete voice leadings in the bass line to an accompanying role. Their time lines, amplitudes, harmonic resonances and pedalings were conditioned by tempi that were considerably faster than that of Horowitz. (Rachmaninov, for example took the arpeggio at measure 37 at twice the speed of Horowitz) The rapidity of their performances excluded Horowitz's "conversational" exchanges between voice lines in measures 35-39 as well as 41- 44. Neither did their full speed crescendos leading up to the climax leave room for a poetically inspired pause in measure 43 (Table 5.13, Figure 5.24/a and 5.24/b).

The first beat of measure 44 had a double function: a) it resolved the voice line sequence into a focal point of the g# minor Prelude and b) it introduced the codetta. With the exception of Horowitz, every pianist focused on a literal reading of the notated voice leadings.

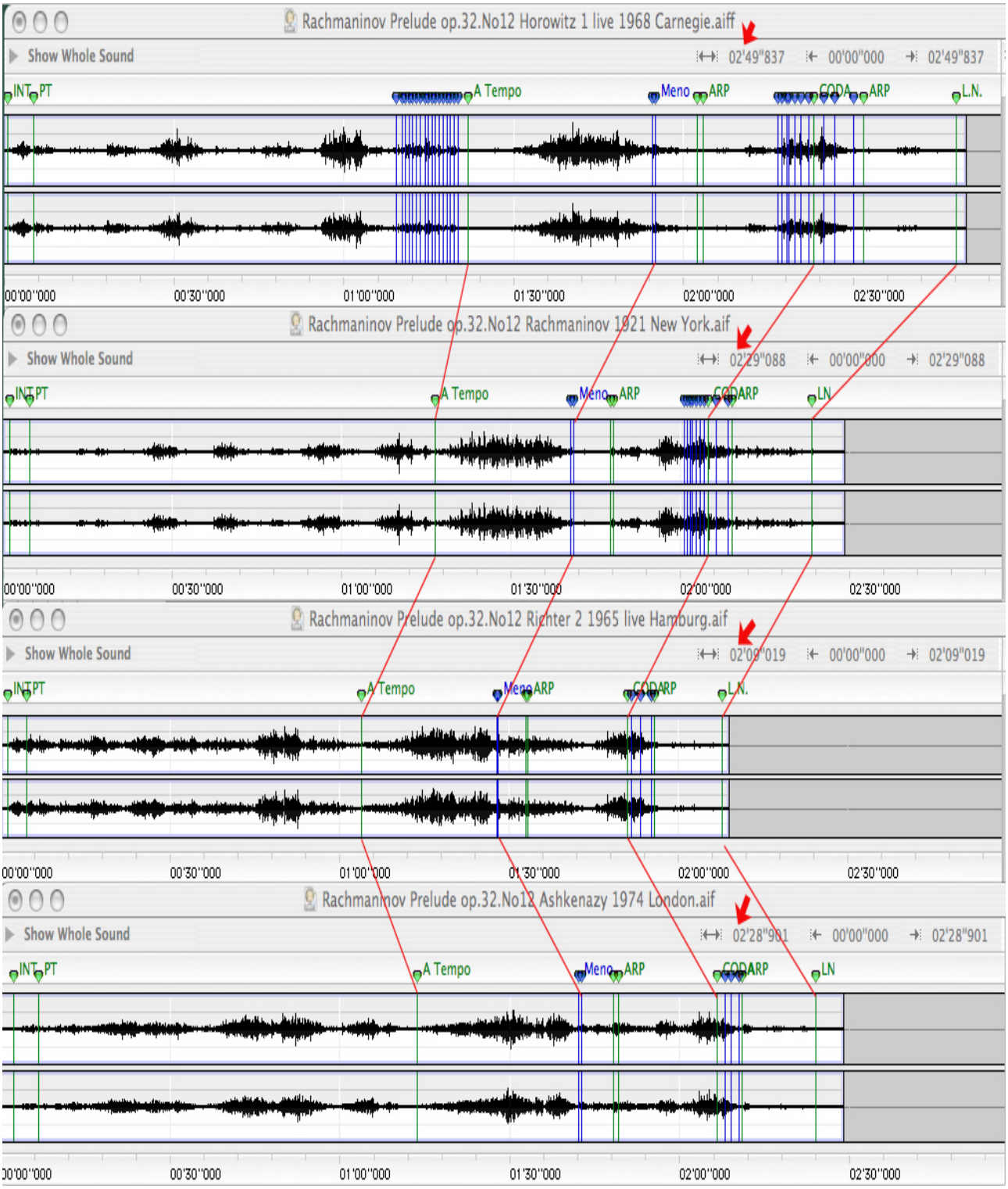


Figure 5.23 Amplitude Timeline - Sergei Rachmaninov's *Prelude in g-sharp minor op.32 No.12*. **Green Markers**: PT- Principal Theme, ARP- arpeggio, LN-last notes entrance. **Blue Markers:** inner voice entrances**. Red markers:** overall timing duration (min.s.ms.) **Red markers between graphs:** timing deviations. Performed by Vladimir Horowitz, Sergei Rachmaninov, Sviatoslav Richter and Vladimir Ashkenazy.

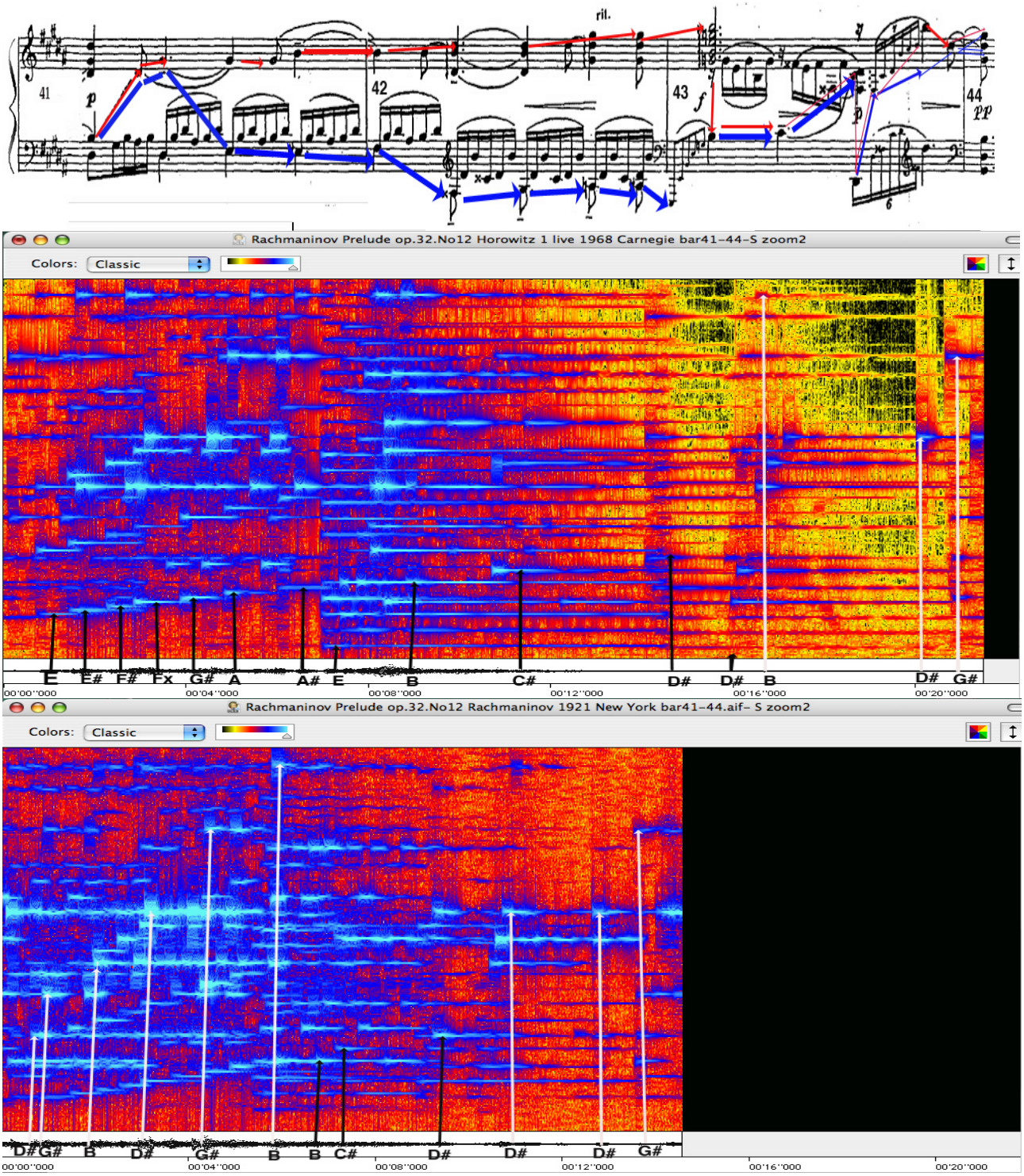


Figure 5.24/a Sergei Rachmaninov Prelude op.32.No.12. Measure 41-44. Vladimir Horowitz 1968, Sergei Rachmaninov 1921.**Score: Blue markers** –inner voice emphasis (Horowitz). **Red markers -** upper voice emphasis (other performers) **Spectrogram: black markers:** inner voice entrances, emphasis and harmonic relationships. **White markers:** upper voice emphasis.

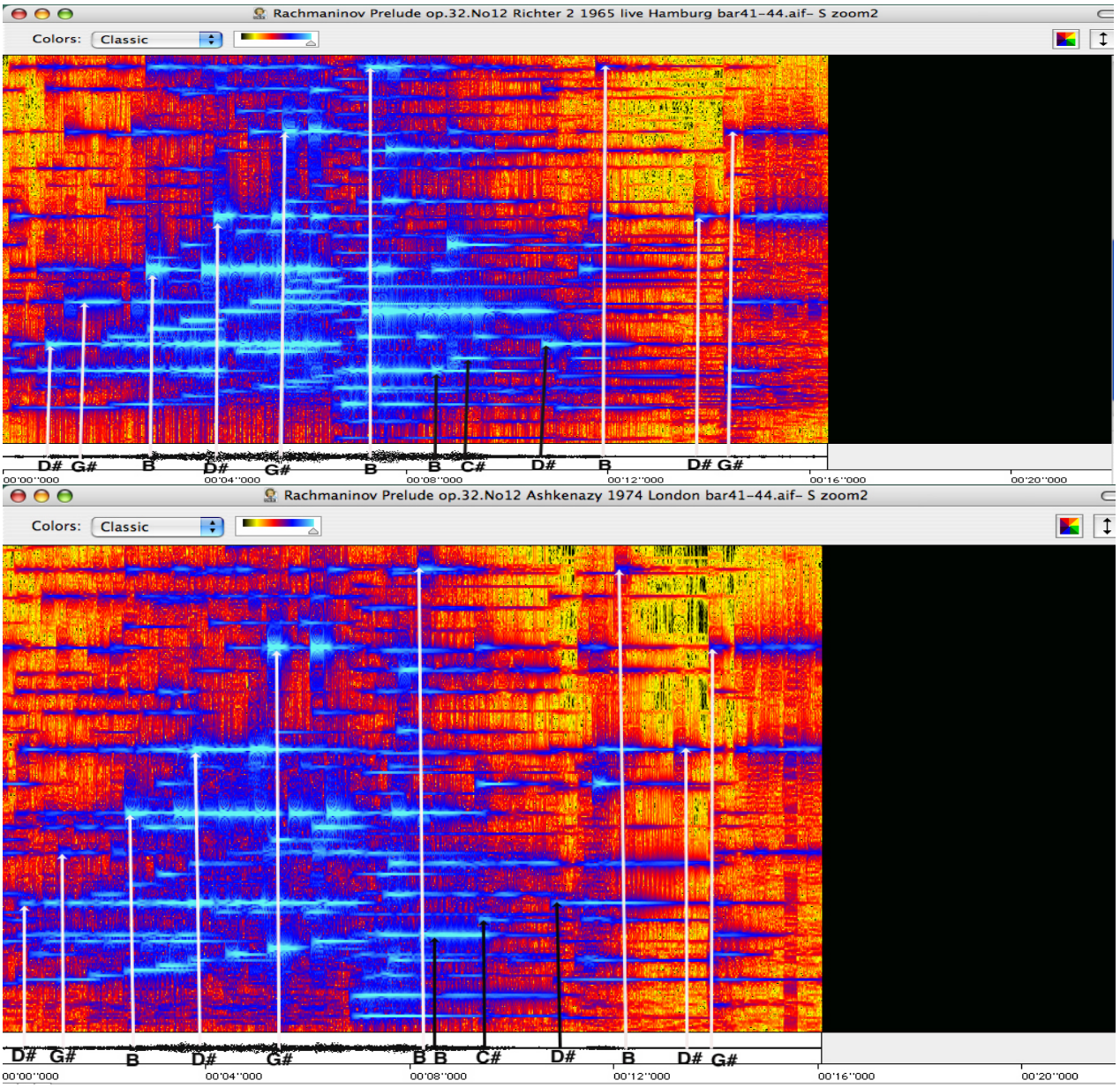


Figure 5.24/b Spectrogram: Sergei Rachmaninov Prelude op.32.No.12. Measure 41-44. Richter 1965, Ashkenazy 1974. **White markers:** upper voices entrances. **Black markers:** inner voice entrances, emphasis and harmonic relationships.

Performer	Date and Place	Live or Studio	Overall Durations Bar35-39 Min.s.ms.	Duration - (Arpeggio-broken chord) entrances - lowest to highest note: c#-d#. Bar 37 Min.s.ms.	Overall Durations Bar 41-44 Min.s.ms.
Vladimir Horowitz	1986 Moscow	Live	00’17”861	00’01”273	00’18”708
Sergei Rachmaninov	1921 New York	Studio	00’16”363	00’00”599	00’13”335
Sviatoslav Richter	1965 Hamburg	Live	00’12”488	00’00”350	00’14”132
Vladimir Ashkenazy	1974 London	Studio	00’14”831	00’00”774	00’13”568

Table 5.13. Comparative timings of overall durations and durations of the broken chord (beat 4) measure 37 of performances of Sergei Rachmaninov *Prelude in g-sharp minor op.32 No.12*.

Figure 5.25/a Score notation and Figure 5.25/b Amplitude Timeline: Measures 35-39

The comparative analyses of measures 35-39 focused on voice leading interactions between a sequence of chords in the bass line (measures 35-37) followed by a sequence of octaves in the soprano line (measures 37-39). The voice leading determined the duration (Table 5.13) and expressive qualities of the arpeggiation in bar 37.

The three pianists performed the arpeggio as a rapidly executed broken chord that is perceived musically as a harmonic point of reference. The red markers within the green vertical lines represent the comparative durations of the arpeggio (Arp. C# -D#) in measure 37 (Figure 5.25/b). The vertical blue lines encompass the comparative durations of entrances from note-to-note. Individual differences in duration are immediately apparent from the opening sequences. Horowitz's upbeat (E-d#) and downbeat (d#-c#) are the longest in duration. Richter's upbeat is the shortest and his downbeat is marginally close to the relatively short durations of Rachmaninov and Ashkenazy. All four pianists differed from each other in the note-to-note durations of the c# - g# sequence that followed. All things considered Richter's overall time line and his traditional treatment of the arpeggio are in keeping with those of Rachmaninov and Ashkenazy.

Horowitz, in contrast performed the arpeggio slower as a note-to-note melodic line. The leisurely paced upward movement of Horowitz's melodic line served to connect the voice leading in the bass register to that of the succeeding soprano line. The result is a voice formed out of an unbroken succession of expressively directed tones.

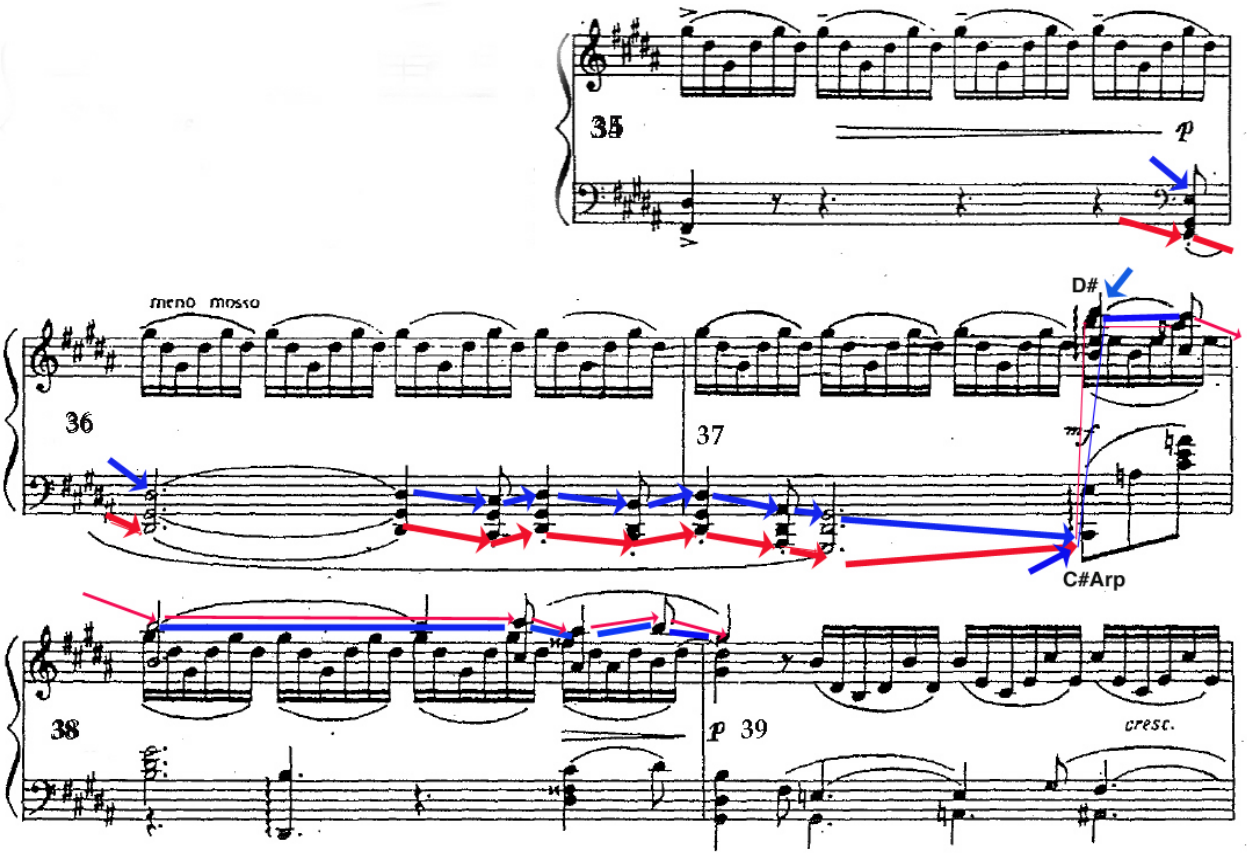


Figure 5.25/a Sergei Rachmaninov Prelude op.32.No.12. Measure 35-39. **Blue markers** -inner voice emphasis –Horowitz. **Red markers:** Rachmaninov, Richter Ashkenazy.
C# Arp. (Arpeggio-broken chord) entrance, continuation of melodic line – Horowitz and Rachmaninov, Richter Ashkenazy.

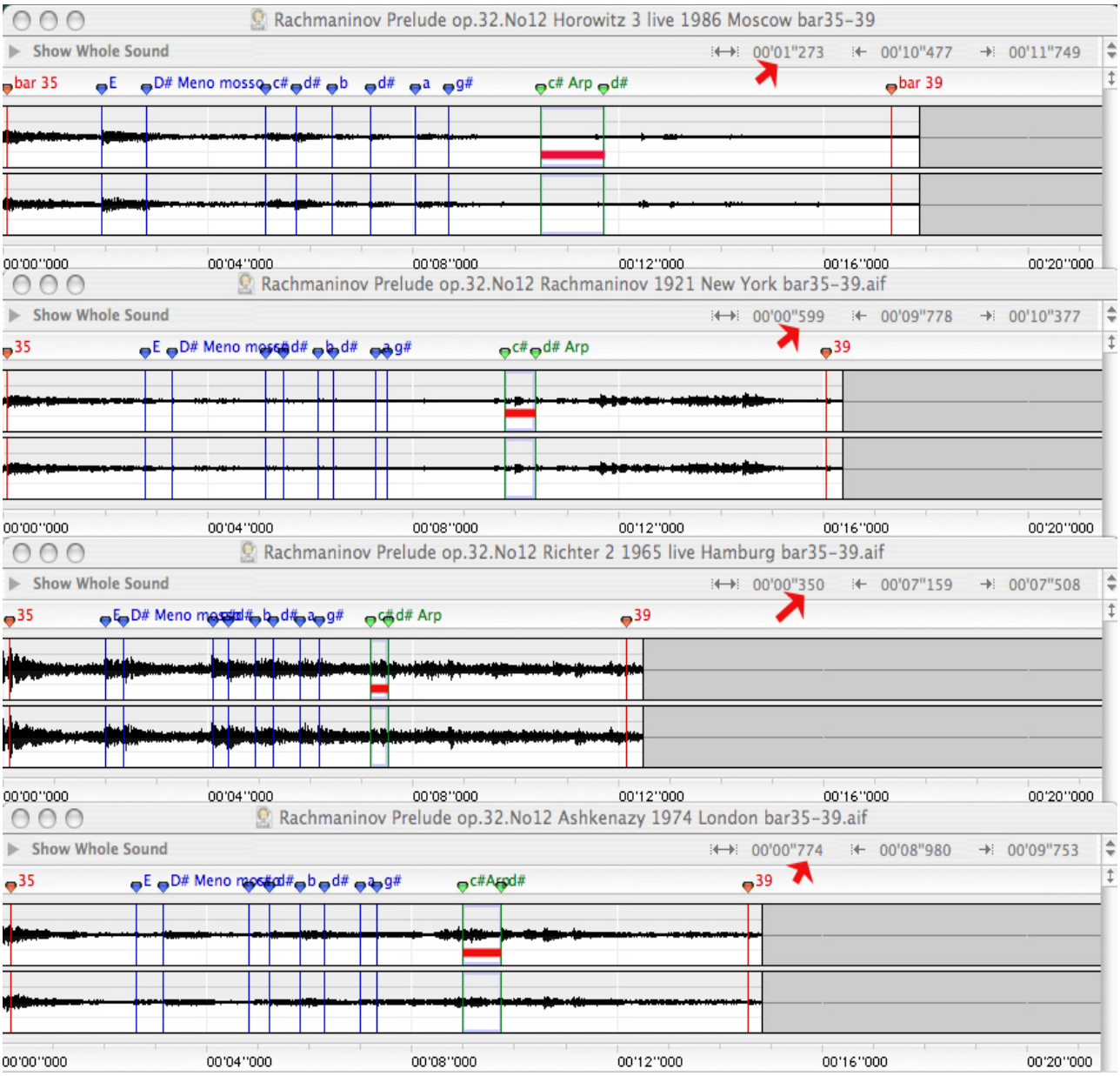


Figure 5.25/b Amplitude Timeline: Sergei Rachmaninov Prelude op.32.No.12. Measure 35-39.Vladimir Horowitz 1986, Sergei Rachmaninov 1921, Sviatoslav Richter 1965, Vladimir Ashkenazy 1974.
Blue markers - inner voices note-to-note entrances, **green marker-** Arp. (Arpeggio-broken chord) entrances (lowest to highest note c#-d#). **Red markers: Arp. -** Durations c-sharp to d-sharp.

Summary:

Horowitz's resolution of strategically placed arpeggios is an unequivocal measure of his musical signature. It highlights the experience of inevitability that he brings to the musical context: an experience that is consistent with his across the board ability to turn a normally unanticipated musical gesture into a logical conclusion. The creative implications that follow are reflected in Horowitz's micro-timed mastery of the "smaller details" that lead to and beyond a given point in the musical line.(Chapter 4) All things considered, the musical result is in direct contrast to the one shared by the three other great pianists.

Horowitz's focus on a given structural point in a composition is roughly parallel to Rachmaninov's concept of a crucial "point" in a work that summarizes it as a whole. (Bertensson S. & Leyda J. Indiana University Press, p. 195, 2001). It is instructive to note how opposed their musical resolutions of the point seem to be in the Prelude. For Horowitz the point offered an opportunity to explore an expressive possibility that appears to challenge Rachmaninov 's musical judgment as a composer-pianist. Yet Rachmaninov was profoundly moved in other contexts by Horowitz's surprise turns of phrase. He admitted that they drew his attention to musical possibilities that had never before occurred to him.

These possibilities can be seen in the consistent and creatively varied examples in the present context. The consistent feature is evident in Horowitz's conversational voicing and his surprise pause. His creative variability can be seen in his novel applications of conversational voice leadings and the surprise effect. The distinctions that followed in the timings and textual emphases between Horowitz and three other major

Russian pianists, including the composer are particularly revealing. When all of these distinctions are considered, the uniqueness of Horowitz's signature voice becomes self-evident.

Sergei Rachmaninov: *Polka de W.R.*

Micro-timing - a joke without words.

Pianists: Vladimir Horowitz: three performances (1986) Sergei Rachmaninov, two performances (1919, 1928), Simon Barere, two performances (1929,1948), Shura Cherkassky, two performances (1979,1991), Mark-Andre Hamelin, one performance (2001). The latest available recordings by Rachmaninov, Barere and Cherkassky were chosen in order to have at hand the best possible reproductions for comparative performance analyses.

The Polka de W.R. is based on a theme by the composer's father Vasili Rachmaninov.

Rachmaninov dedicated the Polka to Leopold Godowsky the celebrated virtuoso-pianist. the dedication makes sense when on considers what is involved the Polka de W.R. experience.

Every one of the pianist's in the study played *with* the Polka beat in the spirit of a rollicking, foot loose and merry parody of the dance. Each in his own way made abrupt changes in the tempo and emphasis to create dance patterns that could easily be perceived of as inebriated: very much in the spirit of unbridled fun that musicians and folk dancers experience when they are playing games with the Polka beat.

Not one pianist however duplicated the tongue in cheek micro-timings of Horowitz's inner voice leadings. In all three performances of measures 8-11 he times the entrance of the opening Eb tenor voice with a decisively accented stress that results in a visual paradox between what one sees and what one hears. The spectrographic representations show a stronger emphasis on the octave overtone (white marker at harmonic) than the Eb that was performed and heard (black marker) (Figure 5.26/b). Thus creating an interesting illusion - *What one sees is not what one hears.*

In his Leningrad performance Horowitz employed the tenor voice to create an overall duration (Table 5.14) . Measures 8-11 were twice as slow as the two preceding performances. The previous performances of the measure were almost identical in their durations. The example demonstrates Horowitz's creatively varied consistency over time and circumstance (Figure 5.26/a).

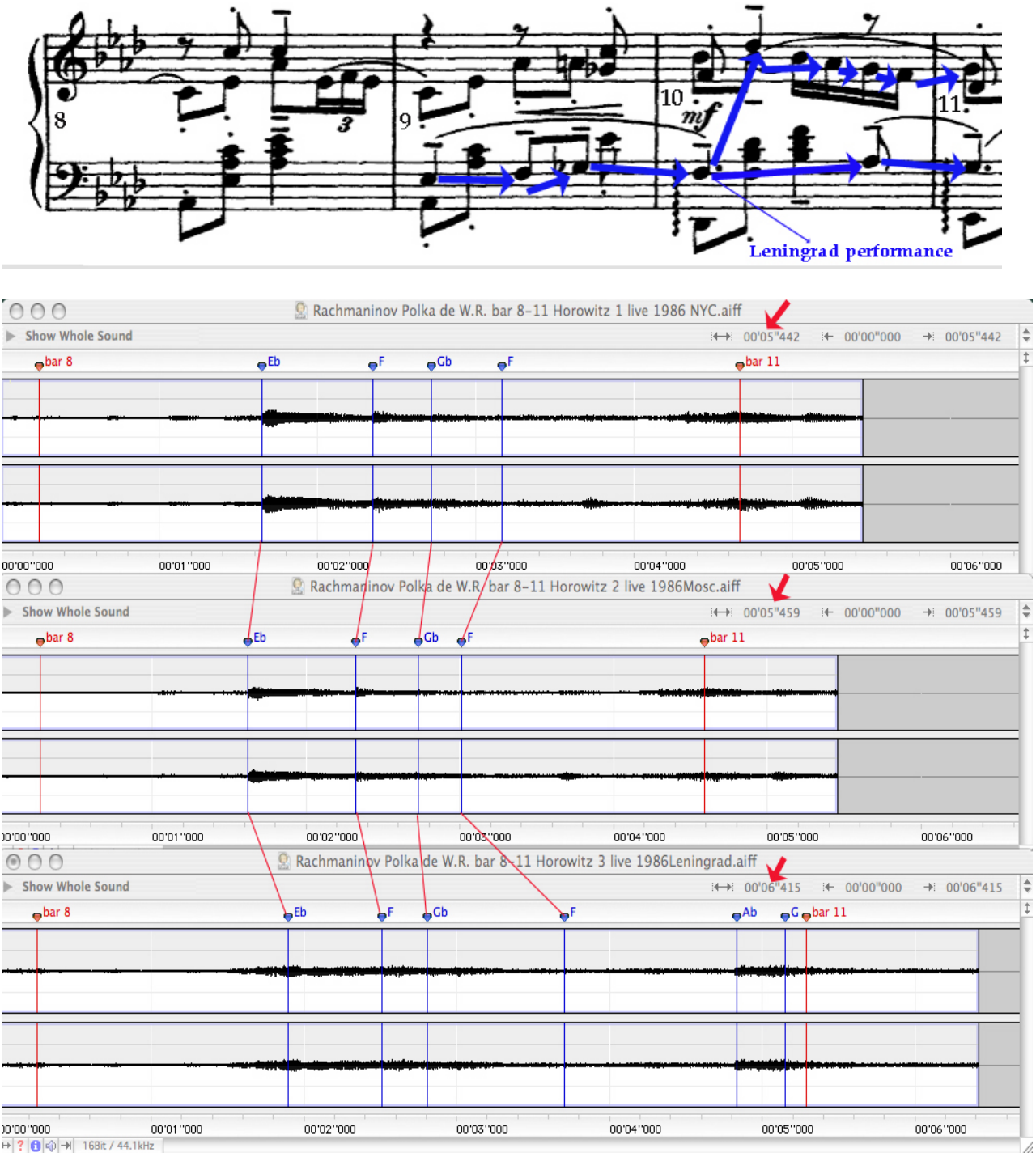


Figure 5.26/a Sergei Rachmaninov *Polka de W.R.* Measure 8-11 of three performances (1986) by Vladimir Horowitz. **Score: blue markers** -inner voice emphasis**, Amplitude Timeline: blue markers:** note-to-note- inner voice entrances**. Red markers:** overall timing duration (min.s.ms.), between graphs –note-to-note timing deviations.

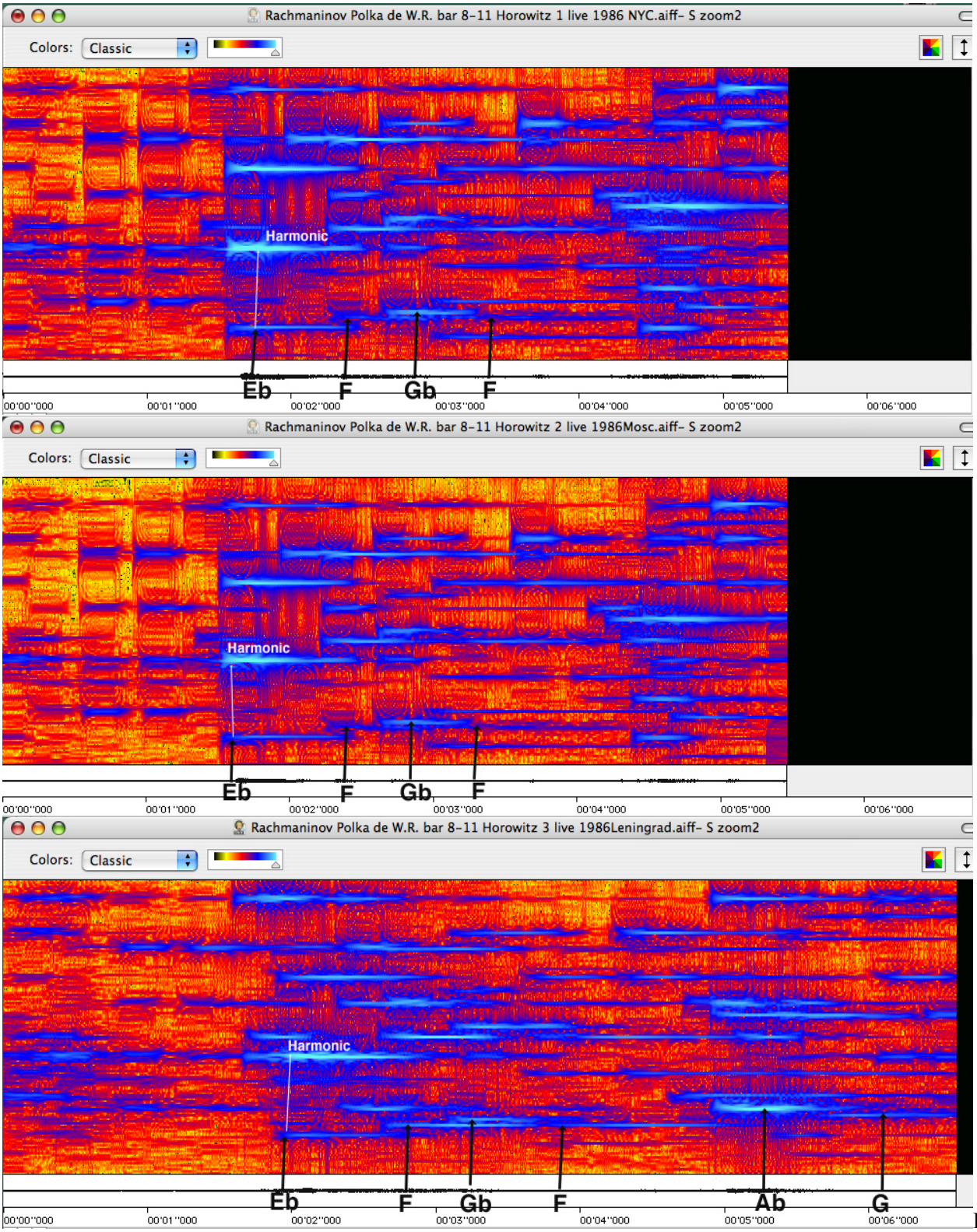


Figure 5.26/b Sergei Rachmaninov *Polka de W.R.* Measure 8-11. Spectrogram of three performances (1986) by Vladimir Horowitz. **Black markers:** note-to-note tenor voice entrances, emphasis and harmonic relationships. **White marker:** *harmonic*

Date &Place	Bar 8 –Eb Min.s.ms.	Eb – F bar 9 Min.s.ms.	F – Gb bar 9 Min.s.ms.	Gb –F bar 9-10 Min.s.ms.	Overall duration bar 8-11 Min.s.ms.
1986 New York	00’01”415	00’00”708	00’00”389	00’00”421	00’05”442
1986 Moscow	00’01”380	00’00”733	00’00”403	00’00”377	00’05”459
1986 Leningrad	00’01”668	00’00”619	00’00”310	00’00”895	00’06”415

Table 5.14 Comparative timings of note-to-note inner voices entrances and overall durations (measure-8-10) of Vladimir Horowitz performances of Sergei Rachmaninov *Polka de W.R.*

The comparative analyses showed imaginatively conceived performances of the Polka that were micro-timed to bring a humorous twist to the experience. Every pianist played a numbers game with quick changing note-to-note timings, articulations and tempos. Each one parodied the dance beat from a perspective that told the joke diffferently from each other. Cherkassky, for example, introduced the principal theme of the *Polka* with a strongly articulated *staccato* that enters into his varied note-to-note timings and eccentric tempo changes throughout both of his performances of the *Polka*. The staccato experience he created brings up images of a Sunday afternoon Prom concert by the local garden orchestra. The punch line came with Cherkassky's sudden break into silence in the final measure that brought a laugh from his audience before he settled on the final note (Cherkassky, 1979).

Rachmaninov and Barere on the other hand, maintained their fast paced dance beats with lightly articulated staccatos. Hamelin's parody of Rachmaninov's Polka begins with his micro -timed transformation of the Principal theme into a lyrical experience. The joke continues in repetitions of the singing theme and dance beat in a alternating in Polka expressively *legato*, alternating it with dance elements. They timed the smaller details of their performances to make lighthearted sense of the polka experience without compromising its nature as a folk dance.

Horowitz's micro-timings and emphasis of his five to six note tenor to soprano voice leadings in measures 8-11(Figure 5.27/a)**,** not only distinguish his parodies of the dance from each other but are virtually unrepeatable by any one else. Take for instance, how Horowitz's overall durations are quicker than those of Rachmaninov while his durations in measures 8-11 are considerably slower. Compared with the other pianists in

the study, regardless of their overall duration of *Polka*, durations of Horowitz's "tenor" measures (8-11) are always longer, shaped by emphasis of his inner voice (Table 5.15).

Pianist	Date/Place	Live / Studio	Overall Duration Min.s.ms.	Durations Bar 8-11 Min.s.ms.
Horowitz 1	1986 NY	Live	03’37”429	00’05”442
Horowitz 2	1986 Moscow	Live	03’38”982	00’05”452
Horowitz 3	1986 Leningrad	Live	03’47”875	00’06”415
Rachmaninov 1	1919 NY	Studio	04’06”517	00’04”063
Rachmaninov 2	1928 NY	Studio	03’44”252	00’04’303
Barere 1	1929 Sweden	Live	03’11”494	00’03”978
Barere 2	1948 NY	Live	03’18”602	00’03”798
Cherkassky 1	1979 London	Live	03’44”224	00’03”474
Cherkassky 2	1999 London	Live	04’05”252	00’03”894
Hamelin 1	2001 London	Studio	03’51”334	00’04”027

Table 5.15 Comparative timings of overall durations and durations of Measure 8-11 of performances of Sergei Rachmaninov *Polka de W.R.*

No other pianist in this study, even the composer himself chose to play with inner voice possibilities. Whatever their individual solutions to timing and articulation may have been they all emphasized the soprano line and delegated the lower voice to maintaining the dance beat. Horowitz, on the other hand, appears to have perceived the Polka as a chamber ensemble that picked up the beat changes from the dancers. The traditional Polka where both the musicians and the principal dancer were free to spring sudden beat changes on each other.

As shown below in Figures 5.27/a and 5.27/b, Horowitz's expressively directed emphasis of the tenor voice line added that extra dimension to his performances that identified them as uniquely his own. One can, as well safely assume that when he draws unusual expressive attention to even a small five note inner line motif it will likely influence one's perception of the composition as a whole. The experience will stand on its own regardless of differences in tone quality, articulation or tempo.

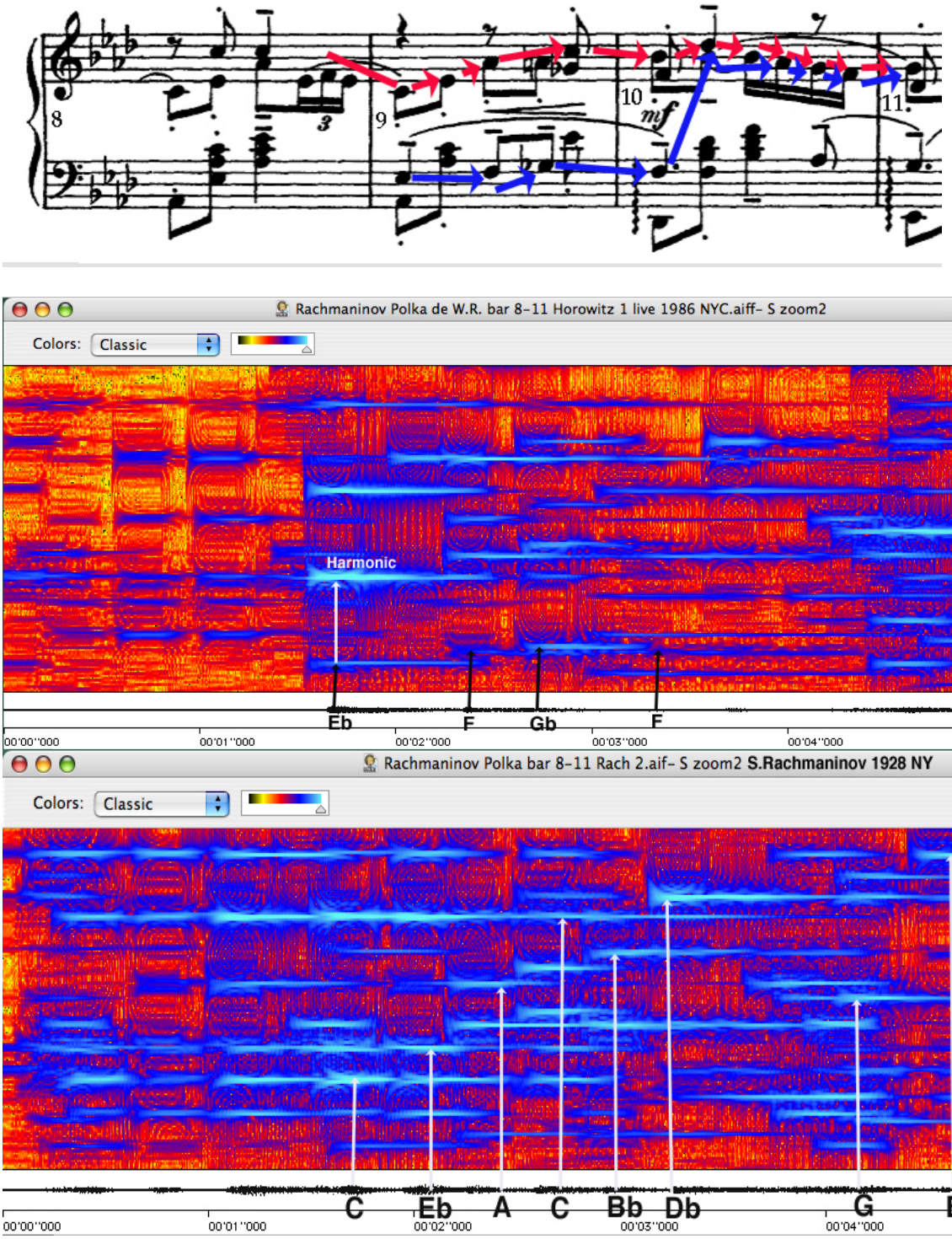


Figure 5.27/a Sergei Rachmaninov *Polka de W.R.* Measure 8-11. performances by Vladimir Horowitz and Sergei Rachmaninov. **Score: blue markers**: Horowitz. **Red markers**: other performers. **Spectrogram**: **Black markers:** inner voice entrances, emphasis and harmonic relationships. **White markers:** upper voice melodic line entrances, emphasis and harmonic relationships.

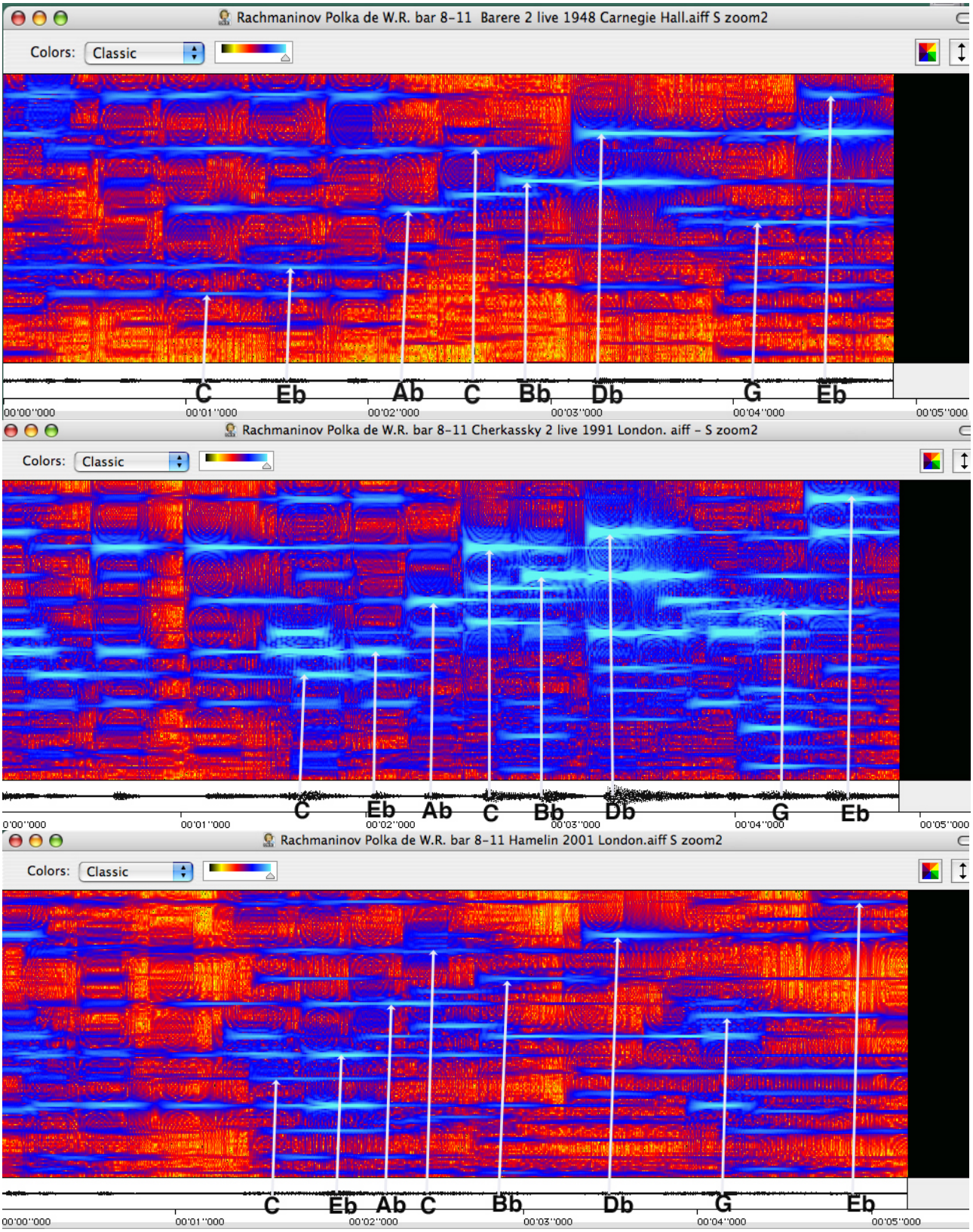


Figure 5.27/b Sergei Rachmaninov *Polka de W.R.* Measure 8-11. Spectrogram of performances by Simon Barere, Shura Cherkassky, and Marc-Andre Hamelin. **White markers:** upper voice melodic line entrances, emphasis and harmonic relationships.

Alexander Scriabin: Etude in C# minor, Opus 2, No.1

Bel canto à la Russe

The comparative analyses of measures 5-9 were selected from four of Horowitz's performances over a period of 23 years.

Following example of these four measures will show the familiar Horowitzian inner voice fingerprint in a context that can be puzzling to the eye. The comparative performance analyses, however demonstrate how 1) Horowitz engages the elusive tenor and soprano voices in a "conversational" *bel canto* mode of performance. 2) How, on one occasion (Berlin 1986) he has the tenor line acting as the primary voice and 3) how he creates an idiomatic "Russian " *rubato* with a surprise shift of emphasis to the weak beat ignoring the notated bar lines to create a momentary dissonance by delaying the resolution of a chord's harmonic tension (see Figures 5.27/a and 5.27/b and Table 5.16**).** In the process, Horowitz's overall timings of the passage are slightly varied. The voicing relationships are micro timed, as usual, with subtly altered note-to note durations and emphases: effectively the paradox of simultaneous consistency and variability) (Table 5.16).

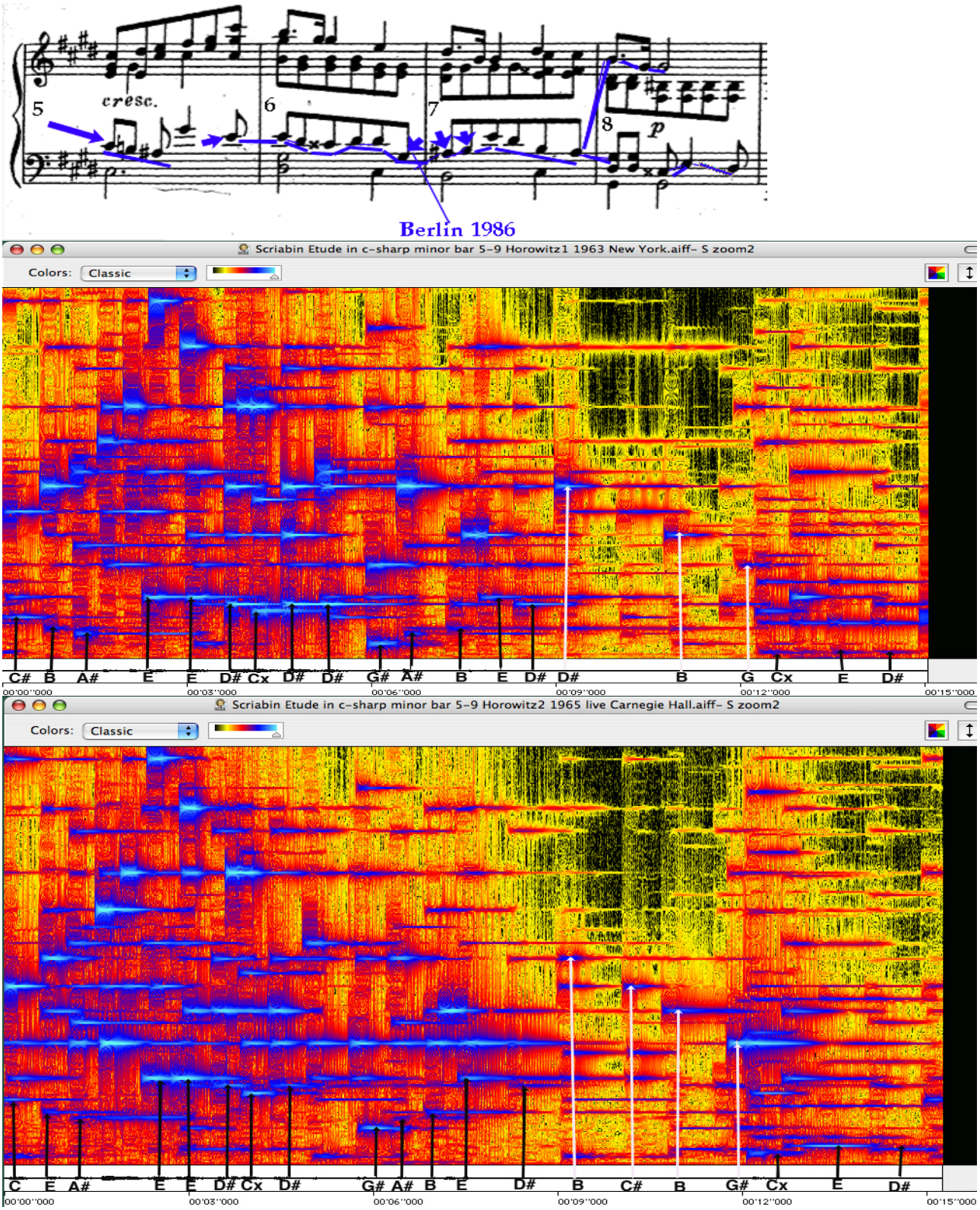


Figure 5.27/a Alexander Scriabin *Etude in c-sharp minor op.2 No.1* Measure 5-9. Spectrogram of two performances (1963-1965) by Vladimir Horowitz. **Black markers:** note-to-note tenor voice entrances, emphasis and harmonic relationships. **White markers:** upper voice entrances, emphasis and harmonic relationships.

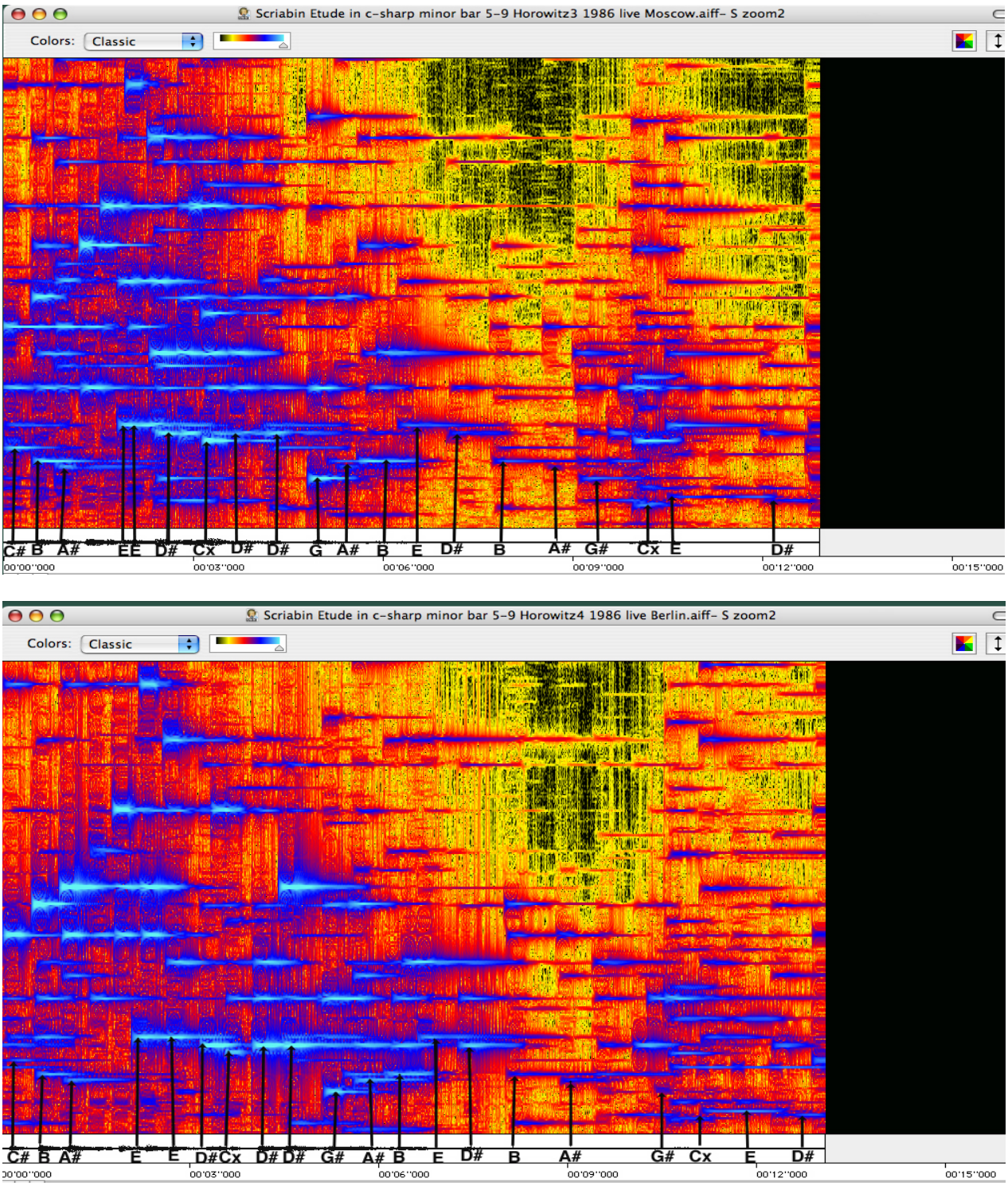


Figure 5.27/b Alexander Scriabin *Etude in c-sharp minor op.2 No.1* Measure 5-9. Spectrogram of two performances (1986) by Vladimir Horowitz. **Black markers:** note-to-note tenor voice entrances, emphasis and harmonic relationships.

Date/ Place	Overall Duration Min.s.ms.	Duration Bar 5-9 Min.s.ms.	Duration Bar 5 a#-e Min.s.ms.	Duration Bar 6 d#-g# Min.s.ms	Duration Bar 7 a#-b Min.s.ms	Duration Bar 7 b-e Min.s.ms	Duration Bar 7 e-d# Min.s.ms	Duration Bar 8 e-d# Min.s.ms
1963 New York Studio	03’06”774	00’14”817	00’01”190	00’00”914	00’00”828	00’00”621	00’00”517	00’01”379
1965 New York Live	02’54”312	00’15”041	00’01”224	00’00”862	00’00”673	00’00”535	00’00”879	00’01”500
1986 Moscow Live	02’39”827	00’12”697	00’01”103	00’00”776	00’00”535	00’00”724	00’00”793	00’01”603
1986 Berlin Live	02’49”019	00’12”846	00’01”172	00’00”742	00’00”569	00’00”586	00’00”569	00’00”207

Table 5.16 Comparative timings of overall durations and of selected note –to note durations (involving resolutions of dissonances) of four performances (1963-1986) by Vladimir Horowitz of Alexander Scriabin Etude *in c-sharp minor op.2 No.1* measures 5-9.

The other six pianists in the study - Simon Barere 1934, Heinrich Neuhaus 1949, Emil Gilels 1980, Shura Cherkassky 1982,Piers Lane 1992 and Garrick Ohlsson 2004, characterize the Etude in one of the two modes. In the first mode the soprano voice is emphasized while the tenor and all other secondary voices are delegated to a quasi *continuo* role in the accompanying musical lines. This allows for periodic section-to-section deviations in the timing. For example, while the second syncopated beat of measure 8 is over-sustained and a lengthy unmarked *ritardando* is introduced in measure 16 (Lane, 1992, Gilels, 1980, Cherkassky 1982, Barere 1934) (Table 5.17**).**

The second mode is a chorale-like structure where the soprano voice is more declamatory in character and the inner voices are treated vertically: that is, harmonically and in unison (Neuhaus, 1949; Ohlsson, 2004).

In both modes all six pianists unfold Scriabin's multi-voiced structure by means of a primary soprano voice over a background of secondary voices (Figures 5.28/a, 5.28/b, 5.28/c and Table 5.17).

Horowitz is, therefore the only pianist in the study who engages the tenor and soprano voices of Scriabin's c# minor Etude in a "conversational" bel *canto* mode of performance; has the tenor line acting as the primary voice and breaks the bar lines by shifting the emphasis from the down beat to the weak beat.

Performer	Date/ Place	Live/ Studio	Overall duration Min.s.ms.	Overall duration Bar 5-9 Min.s.ms.
Horowitz	1965 NY	live	02’54”312	00’15”016
Gilels	1980 London	studio	02’57”160	00’13”644
Lane	1992 London	studio	02’57”094	00’14”418
Cherkassky	1982 London	live	03’10”023	00’16”164
Barere	1934 London	studio	03’10”854	00’16”463
Neuhaus	1949 Moscow	studio	03’15”467	00’15”939
Ohlsson	2004 NJ	studio	03’23”494	00’15”989

Table 5.17 Comparative timings of overall durations and durations of Measure 5-9 of Alexander Scriabin *Etude in c-sharp minor op.2 No.1,* performed by Vladimir Horowitz, and six other pianists.

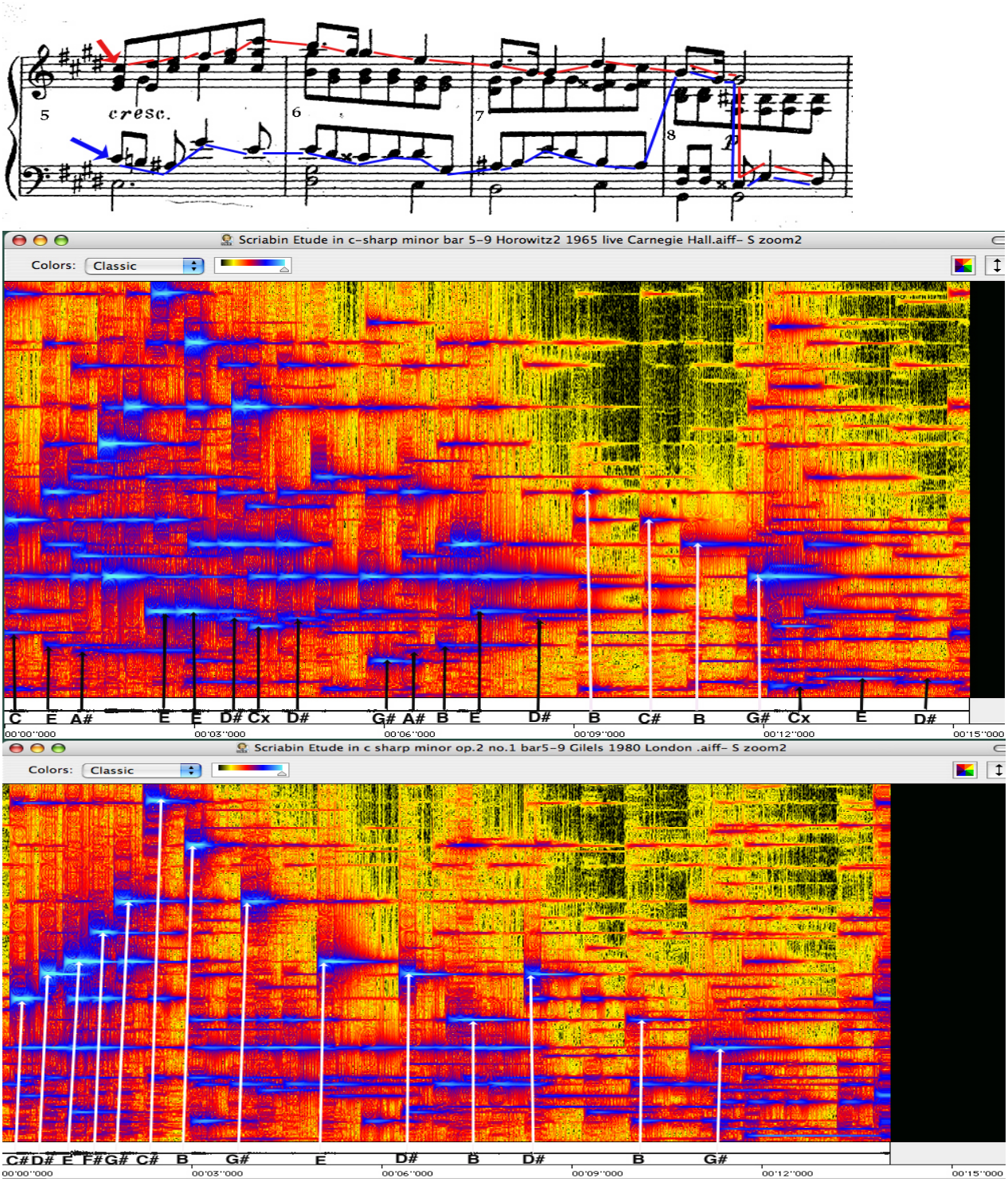
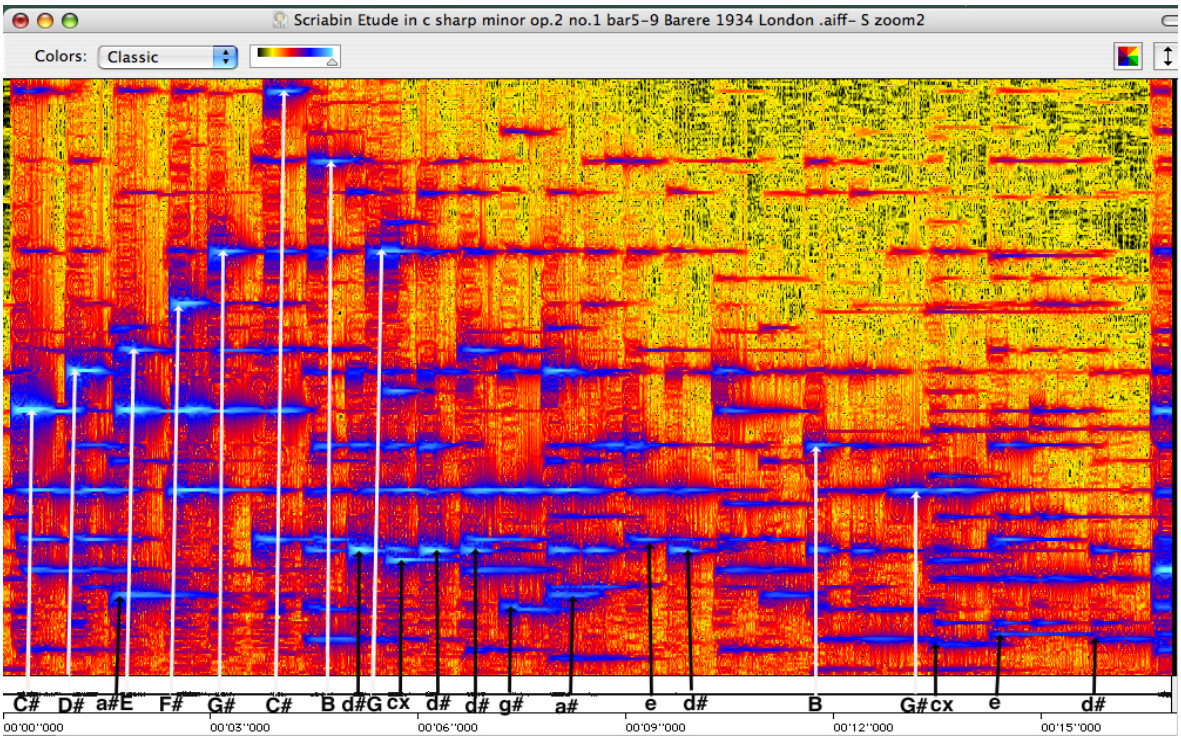


Figure 5.28/a Alexander Scriabin *Etude in c-sharp-minor op.2 No.1.*Measure 5-9.**Score**: **Blue markers**: Horowitz. **Red markers**: Gilels. **Spectrogram**: performances by Vladimir Horowitz and Emil Gilels. **Black markers:** lower voice note-to-note entrances, emphasis and harmonic relationships. **White markers :** upper voice entrances, direction, emphasis and harmonic relationships.



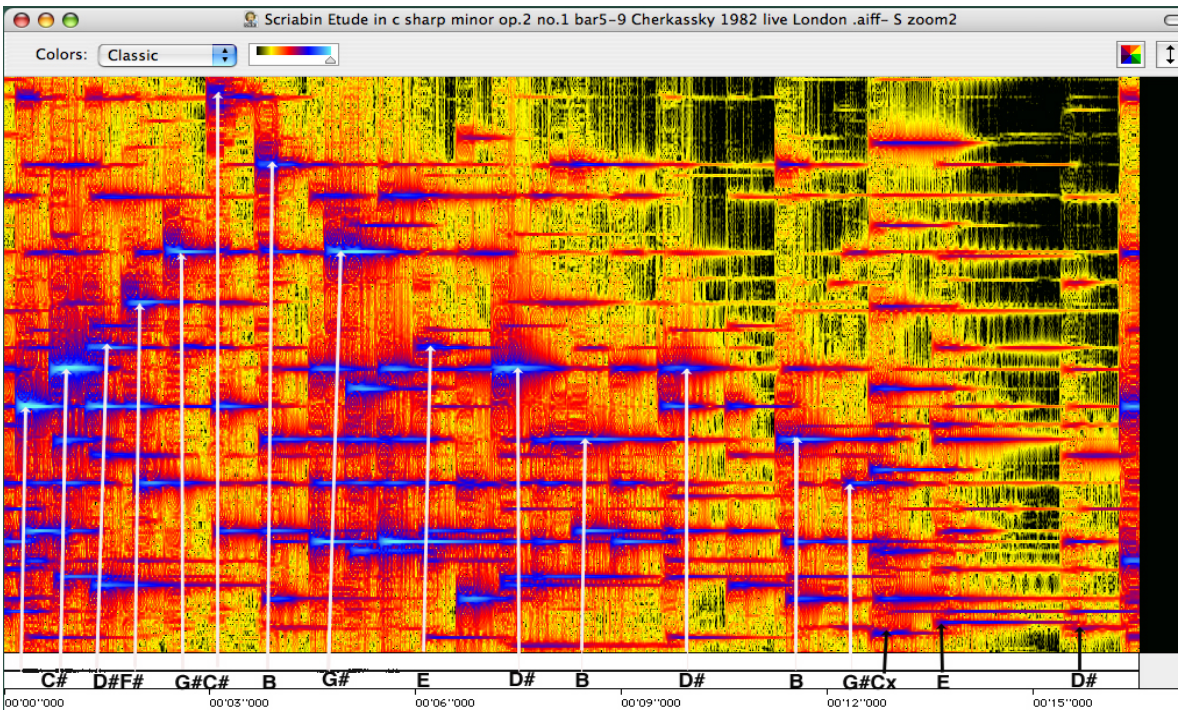


Figure 5.28/b Alexander Scriabin *Etude in c-sharp-minor op.2 No.1*.Measure 5-9. **Spectrogram**: performances by Simon Barere and Shura Cherkassky.
Black markers: lower voice note-to-note entrances, emphasis and harmonic relationships.
White markers : upper voice entrances, direction, emphasis and harmonic relationships.

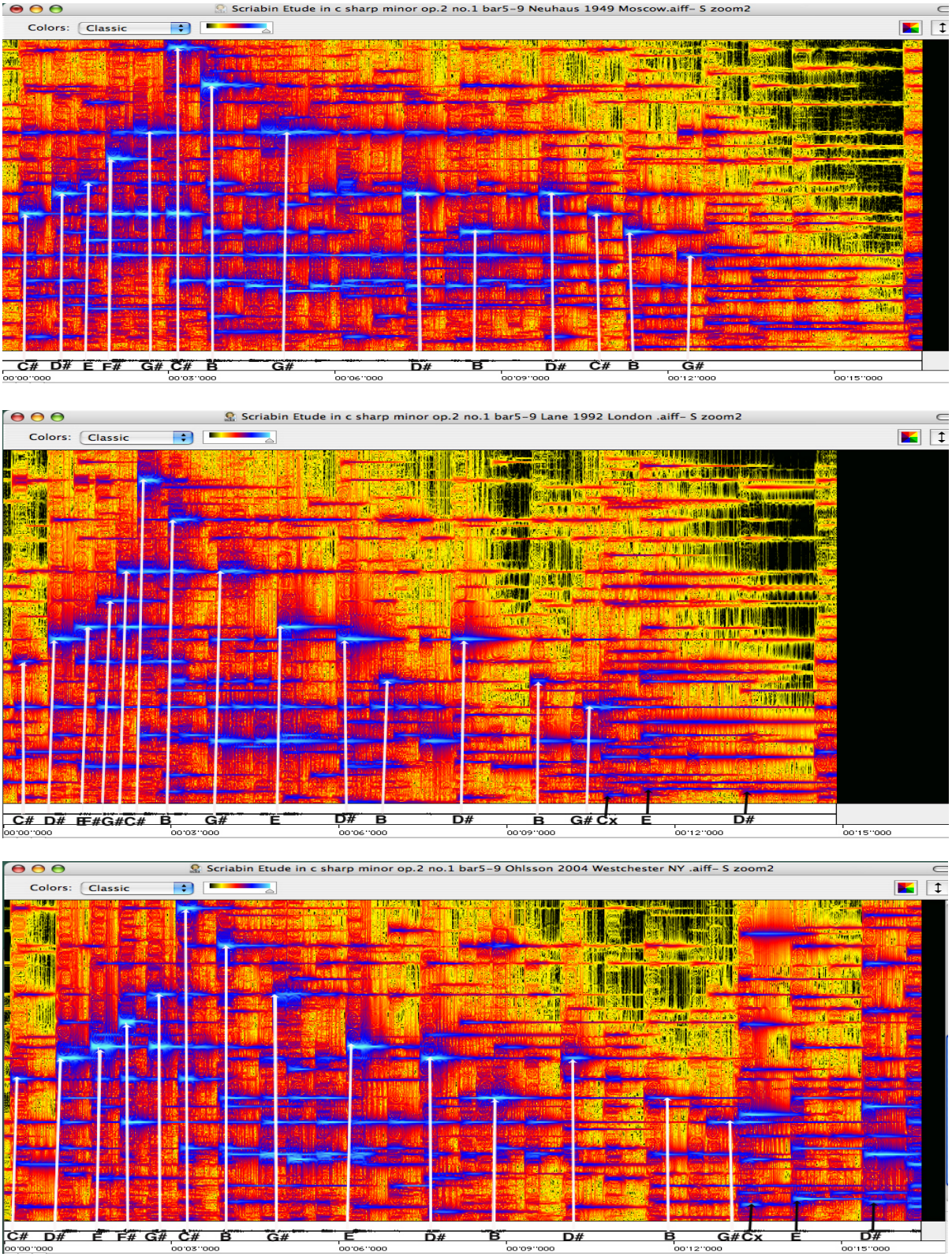


Figure 5. 28/c Alexander Scriabin *Etude in c-sharp-minor op.2 No.1.*Measure 5-9.
Spectrogram: performances by Heinrich Neuhaus, Piers Lane and Garrick Ohlsson.
Black markers: note-to-note entrances, emphasis and harmonic relationships.
White markers: upper voice entrances, direction, emphasis and harmonic relationships.

On a parting note the comparative performance analyses of Vladimir Horowitz's Signature Voice will come full circle with a one on one "Timing the Muse" by two great pianists—Vladimir Horowitz and Glenn Gould. Comparative performances by these two celebrated artists of the four concluding measures of a movement of a Haydn Sonata (Hob.XVI/49) will show why paradoxes between the overall timing and the final measures of a performance by a highly accomplished pianist will bring an entirely different musical experience to the expected conclusion of the work as a whole.

Paradox of timing

Gould's overall timing is considerably slower (about 40s.see Table 5.18) than that of Horowitz. Yet his timing of the last four measures (120 -124) is about 8s. quicker than Horowitz. The paradox is due to three factors indigenous to high-level performance creativity. 1) Phrasing relationships: timings that are influenced by the balance, shape and peaks of successive phrases in motion 2) Timings influenced by varying degrees of intensity in motion 3) Timings influenced by the performer's touch qualities: Gould in the present context employs a non-legato touch with relatively equal durations and minimum variability: Horowitz employs a *bel canto* touch that "breathes" throughout the movement in impulses that *necessarily vary* with the emotive tone of the phrase and its dynamic relationships. The subtle pushing and pulling of Horowitz's beat from the opening statement to the coda therefore sets the pace for a four measure climax that summarizes the movement with a broad *ritardando.*(see Figure 5.29). Gould's extremely slow tempo throughout the movement makes slowing down in the final measures an unlikely musical option.

Performer	Date/ Place	Live/ Studio	Overall Duration Min.s.ms.	Bar 120-124 Overall duration Min.s.ms.	Bar 120 *ostinato* Bb-Bb duration Min.s.ms.
Horowitz	1989 NY	Studio	08’08”667	00’29”546	00’00”828
Gould	1981 NY	Studio	08’47”890	00’21”548	00’00”624

Table 5.18 Comparative timings of overall durations, durations of last four measures and note-to note ostinato of Vladimir Horowitz and Glen Gould performances of *Adagio e cantabile* from Haydn Sonata in E-flat major Hob.XVI/49.

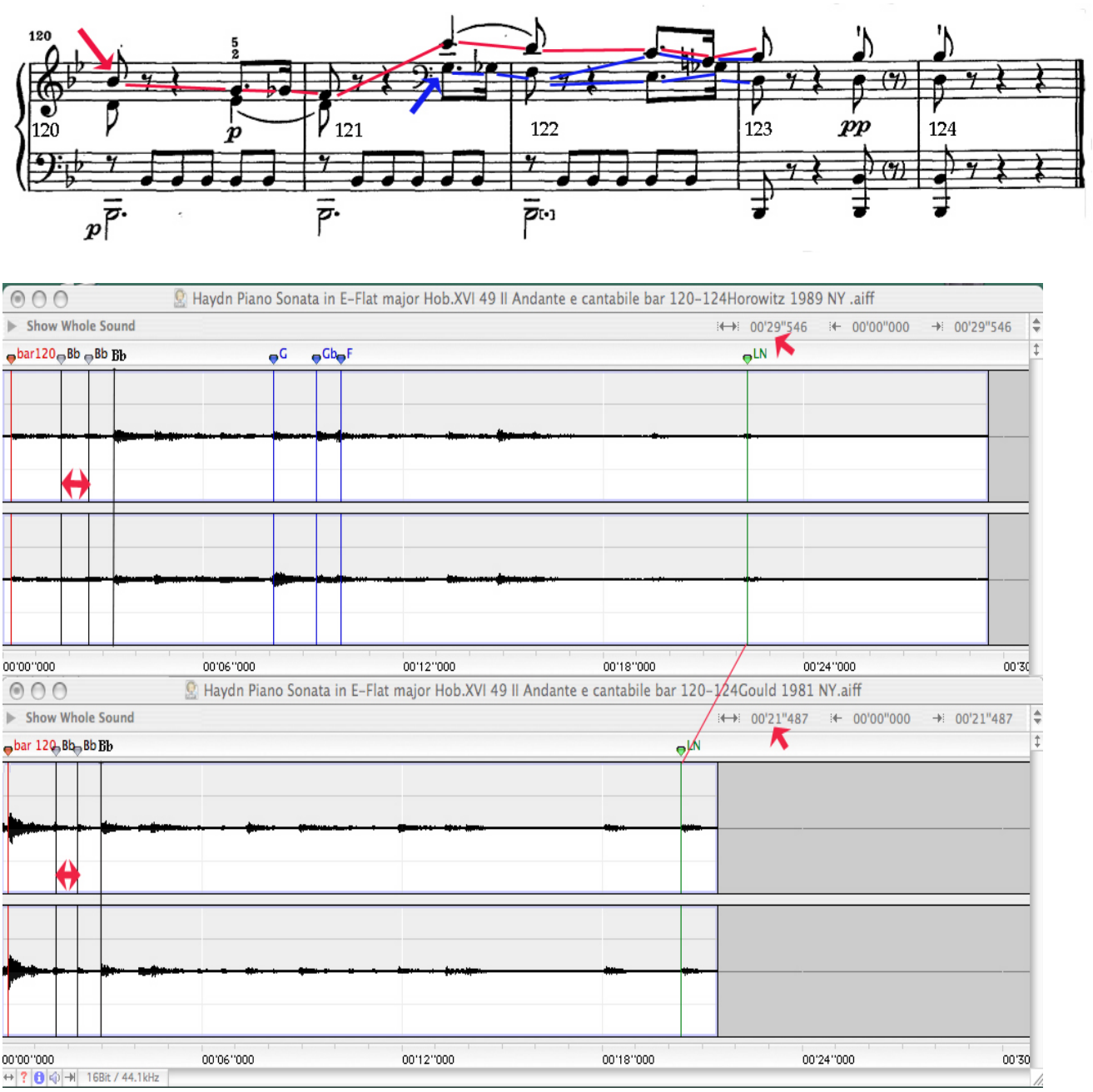
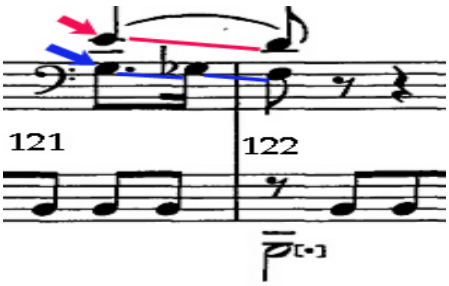


Figure 5.29 Haydn Sonata in E-flat major Hob.XVI/49 Adagio e cantabile bar 120-124. **Score - Blue markers**: Horowitz. **Red markers**: Gould. **Amplitude time-line - Blue Markers:** inner voice entrances**. Red markers:** overall timing duration (min.s.ms.), **Red markers between graphs:** timing deviations. Bb- *ostinato* entrances.

Why 40 s. difference on overall and reversed in last four measures.

Horowitz's performance of Haydn's *adagio e cantabile* is a playful romp that dances to a lightly nuanced singing touch. In effect he brings a perspective to the term *cantabile* that illustrates his conviction that the composer's directions are cues to be played with and even "improved" upon when necessary.(Dubal,2004 pp,135) To Horowitz, like Mozart and Chopin before him the cue invariably finds its place in the options afforded by his singing touch. Horowitz's pedaling in measures 121-124 added a resonating effect to the underlying *ostinato* that suggests the drone of low strings in folk music. His pedaling in measures 121- 122 also influenced the *bel canto* tone of the upper level three-note motif (Figure 5.30*)*, that disregards the rests in the final measure (124). Horowitz thereby created a completely different experience than Gould by adding 8 seconds to the overall duration of the last four measures and 200 milliseconds to the *ostinato* on Bb!



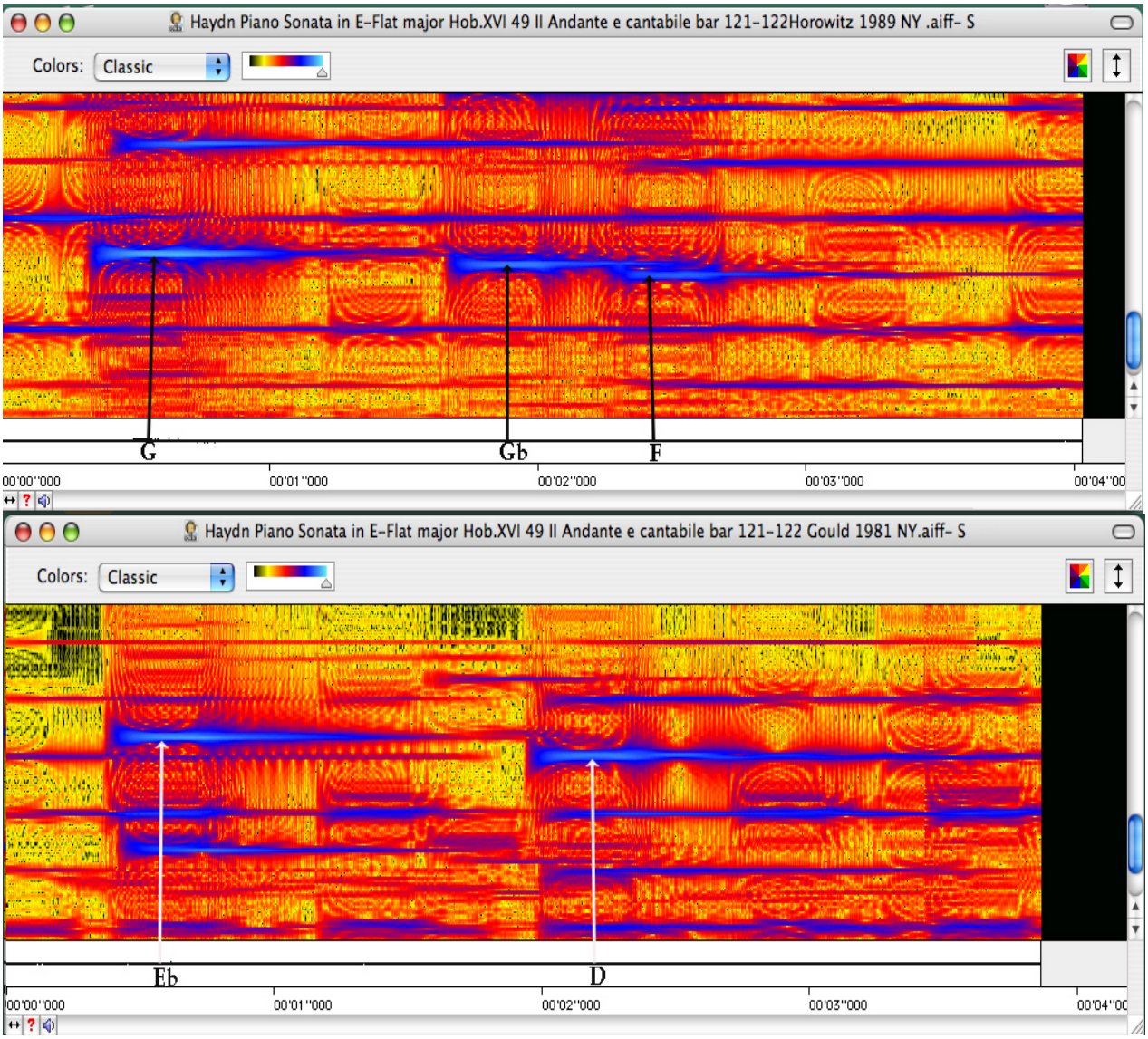


Figure 5.30 Haydn Sonata in E-flat major Hob.XVI/49 Adagio e cantabile bar 121-122.
Score - Blue markers: Horowitz. **Red markers**: Gould.
Spectrogram- black markers lower voice note-to-note entrances, emphasis and harmonic relationships (Horowitz). **White markers:** upper voice note-to-note entrances, emphasis and harmonic relationships (Gould).

The opening pages of “Timing The Muse” make the point that a pianist’s mastery of timing is the ultimate measure of the musical experiences that he or she creates. Horowitz‘s 00’29”546 timing of the four concluding measures of the Haydn Sonata summarizes the argument that the selection of a key excerpt from a work for comparative performance analyses, no matter how brief it may be, can alter the entire musical experience. The implications of this assertion in terms of the findings of this thesis will be reviewed in the following closing chapter.

CHAPTER 6

BEYOND ANALYSIS: THE BALANCING ACT—REFLECTIONS AND SUMMARY

Chapter 1 (Timing the muse) introduced the thesis with a thought-provoking quote.

"The composer creates the music

The performer creates the experience

The listener interprets the experience"

Phil Cohen

The above quote was followed by the description of a scene from a live video recorded concert. Vladimir Horowitz was shown playing Robert Schumann's Träumerei. The experience was described as "a mood of shared intimacy" that unfolded as the camera scanned back and forth from Horowitz at the piano to close-ups of his listeners. Most revealing were eyes filled with tears, eyes restraining tears, eyes shut in reverie.

The mood of shared intimacy created by Vladimir Horowitz revealed a deeply moving entente between a great performing artist and his listeners. The emotional depth of the entente confirmed the creative power of the experience and by inference the raison d'être of the thesis. In effect, the exclusive properties of the experience, including its subjectivity, became guidelines in the search for a viable approach to identifying how musical experiences are communicated by highly accomplished pianists.

In this regard, it is important to recall that while virtually every pianist in the study created an emotionally charged musical experience out of an identical passage,

each achieved it with his or her own distinctive performing voice. It is for this reason that the complexities involved in distinguishing the signature voices of these highly accomplished performing artists from each other required an analytical process that concentrated on individual differences between the best and the best.

This concluding chapter will review, discuss, and summarize the above and related questions that arose in the comparative performance analyses of highly accomplished pianists. The review will be prefaced by a discussion of expressively directed micro timing; its relevance in establishing a working hypothesis and its role in transforming aesthetically conceived insights into emotionally charged experiences. Attention will be given in particular to circumstances where computer based analyses required aural input in order to account for performing issues that elude visual representation.

All things considered, the highly charged emotional content of these experiences inevitably led to questions of how objective analyses might somehow be reconciled with subjective perceptions.

The concern was not about the relevance of subjective experiences but how they might best play a supporting role in the analytical process. And if so, how might the analyst go about enlisting that support. All things considered, the question of how a pianist might go about moving an audience to tears, or for that matter, creating any powerful emotional response, suggests reconciliation between objective evidence and subjective perceptions. How one might go about achieving a viable balancing act between these considerations will be discussed in a variety of contexts throughout the chapter.

The discussion will begin with a review of the rationale for choosing expressively directed micro-timing as the primary tool for comparative performance analyses.

Expressively directed micro-timing: its analytical significance in hindsight

Expressively directed micro-timing was chosen as the logical choice for a comparative study of the individual musical voices of celebrated pianists (Chapters 1 and 3). In this regard it might be useful to recall the distinction that was made between expressively directed micro-timing and more generalized concepts of timing and expressivity. Expressive timing, for example, remains the norm in almost all previous studies on performance. (A partial exception is the term expressive micro-timing employed in separate studies by both Vijay Iyer (2002) and Fernando Benadon(2009). Expressively directed micro-timing will be broken down here into its component functions. This should help distinguish their combined intent from the above. With this distinction in mind the term expressively directed implies that a highly accomplished pianist is in direct command of a specific expressive experience he or she intends to communicate. The term micro-timing implies that the pianist has at hand a precise means for carrying out his or her intentions, no matter how minutely nuanced the timings may be. Guesswork is less likely to enter into the equation when expressively directed micro-timing, intention and action are considered in terms of a unified whole.

These considerations made it possible to show where and how certain consistent features of a master pianist's signature voice could be identified over time, repertoire and creative variability. When considered as a unified whole, they provided the rationale with a

method of comparative analyses that aimed at accounting for the expressive diversity that distinguishes the musical experiences created by a highly accomplished pianist.

Establishing the hypothesis

The study, accordingly, drew on working references that shared a recognition of the necessary interactions between the subjective and objective realities that enter into the creation of a musical experience. These included Phil Cohen's (2008) concept of an embodied conductor delegated to synchronize and expressively direct the timing of a pianist's biological, esthetic and cognitive resources. Cohen emphasized the point, that the synchronization of these resources made it possible for the pianist to expressively direct the communication of her esthetic vision. These also included Franz Liszt's perception of the modern piano as the only instrument that offered the player a range of expressive options equal to that of the orchestra. Also, there were important considerations from Vijay Iyer's (2002) and Fernando Benadon's (2009) psychological studies of micro-timed durations in jazz and blues. Their analyses of syncopated (off the beat and between the beat relationships) and subtly varied shifts in timing provided viable support for the present study's argument that highly accomplished pianists employ means for communicating what they hear that are not normally available to the majority of pianists (Chapter 3).

Establishing the balancing act: objective and subjective considerations

As noted above there was a need in the present study to account for the subjective as well as the objective considerations that enter into the comparative performance

analyses of musical experiences. As a consequence, the issue of how best to establish a productive balancing act between the subjectively experienced qualities of sound and the necessary constrictions of objective analyses became a focus of attention.

The need for a reconciliation of these contrasting perceptions becomes evident when one considers the accuracy and attendant limitations that come with spectrographic, amplitude and time-line representations of a musical performance.

To begin with, these computer-based analyses can be seen to precisely time and measure the minute durations, amplitudes and resonating features of a musical performance. They are able to render visually details that may be missed upon first hearings of a performance. Careful acoustic analyses can thereby confirm their synchronizations by visually representing previously unnoticed details. Amplitude, time line and spectrographic representations are therefore valuable tools for performance analyses.

On the other hand, one must also consider what gets lost when these otherwise precisely analyzed representations stop short of representing the more elusive qualities of a pianist's musical voice (Chapters 4 and 5). There are circumstances where these qualities may provide substantial information on the musical properties of a highly accomplished pianist's signature voice that cannot be overtly represented by acoustic analysis. Take, for example, the varied touch and tone qualities of a pianist's singing voice as shown in Chapter 4 or the "spectrographic single note illusion" in Chapter 5. Despite these reservations, there is no question about the fact that computer based analyses have provided researchers with unprecedented tools for unraveling the creative workings of a highly accomplished pianist. The discussions that follow will consider the

broader scale of possibilities that can be explored with the computer in hand and one's ears on the musical details.

Broadening the perspective

The comparative analyses reported in the present study accounted for the role of expressively directed micro-timing in communicating the varied emotional experiences created by a celebrated pianist. How then does one begin to summarize the broader significance of these precisely timed musical experiences over the long term? What has expressively directed micro-timing revealed about the creative workings of some of the greatest performing artists of the 20th century? What can be learned from identifying individual differences between the performances of great pianists that might provide clues to their performing signatures? And where might the results lead towards future research into the role that expressively directed micro-timing plays in creating emotionally charged experiences?

These questions are best dealt with in a discussion of my personal experiences, observations and reflections conducting key aspects of the analytical process. The balancing act introduced above will be a primary focus of attention throughout the discussion.

Personal experiences and observations: A subtext to the comparative performance analyses

My personal experiences conferring with my advisors, collecting the data, organizing the methodology and conducting the comparative analyses have formed the

subtext this thesis. It is a subtext because everything that emerged in the formal analyses reported in the preceding chapters was partly grounded in exchanges between objective and subjective experiences that developed in the course of hundreds of hours of listening to repeated performances of the same work.

I consider these experiences essential for the following reasons. My observations are those of a relatively novice researcher who happens be a concert pianist and teacher. It was in this sense that I came to the process without a pre-conceived formal, theoretical or analytical framework in mind. All of my previous research efforts were confined to assisting in the recording, filming and exploratory analyses of live, on stage performances by solo and chamber music players. Analysis as I understood it had to do with generalized experiences grounded in my life as a performing artist and observer. It became necessary, therefore, to acquire the tools of objectively directed analyses from scratch.

In the pages that follow, I will discuss my perceptions in the following contexts.

(1) The Horowitz legacy.

(2) Conducting the comparative analyses.

(3) The micro-timed "as if" explorations of the analytical experience.

(4) The significance of performances recorded for the data base that are not included in the main stream analyses of the thesis.

(5) Clarifying remarks on the implications of expressively directed micro-timing on one's perception of the score, creative variability and a great pianist's signature voice.

(6) Suggestions for future research into expressively directed micro- timing with objective analyses.

I will begin with a brief review of my observations on the collective experiences of listeners, colleagues and critics that distinguish the legacy of Vladimir Horowitz.

The Horowitzian Experience: its legacy

Vladimir Horowitz was universally recognized as a poet of the piano, arguably among the greatest of the past century (Plaskin, 1983). He was a troubadour who sang and recited songs without words with nothing more than his fingers, toes and an instrument to sing through. Songs that touched the hearts of hundreds of thousands of listeners in every corner of the world. Epic songs, love songs, lullabies, songs of mourning, of pure fun, comfort and tender recollection. Universally understood songs that brought laughter, joy, surprise, nodding acknowledgment and tears to his listener's eyes. And thunderous applause.

Horowitz the poet of the piano didn't just sing and recite songs without words. He electrified his listeners. His fingers and feet scanned the keyboard with astonishing speed and hair-raising powers of expressive communication. The sheer force of his dynamic contrasts never disturbed his command of tone qualities. There was no banging on the keys or snapping of the strings. The Horowitz sound was always there. Every mind blowing experience he created confirmed Horowitz as a great pianist/conductor of a one-man symphony orchestra. The poet of the piano was a titan of the keyboard.

Sergei Rachmaninov was so overwhelmed after hearing Horowitz perform his Third Piano Concerto he never played it in public again. He was convinced that there was

no way he could play it as well as Horowitz, let alone outdo him. Rachmaninov later admitted that listening to Horowitz, made him aware for the first time of the built in "possibilities" of the piano that had never before occurred to him. An astonishing admission from a great composer/pianist (Schonberg, 1992). They became good friends.

Some of Horowitz's colleagues were so intimidated, that Artur Rubinstein once sank into a period of depression after sitting through a Horowitz concert that enchanted the audience with musical experiences that were as varied as they were emotionally moving. Throughout his life Rubenstein found it difficult to acknowledge Horowitz any longer as an artist and a long time friend (Kesting, translated by Williams, 1986; Schonberg, 1992).

The conductor Wilhelm Furtwangler once attempted to dismiss Horowitz as a mere entertainer. Furtwangler knew that it was a gesture of collegial respect in the nineteen twenties to grant a soloist the privilege of opening the concert accompanied by the orchestra. After a rehearsal for a gala event in 1928 Furtwangler apparently reversed the privilege by beginning with Anton Bruckner's monumental 9th Symphony. Horowitz's performance of Franz Liszt's A Major Concerto was accordingly delegated to second place in the final half of the program. Reversing the order was somehow Furtwangler's way of demonstrating the superiority of first rate orchestral music over a mere show piece chosen by the pianist to draw attention to his digital skills. Horowitz never forgave Furtwangler (Kesting, 1986).

Horowitz's performances did not impress all of his colleagues, and he knew it. How the occasional negative response from fellow pianists may have contributed to his off stage eccentricities and his doubts about his legacy are questions best left to his

biographers (Dubal, 1991; Plaskin, 1982; Schonberg, 1993). They would certainly qualify for a research study on the artist as a man.

Concluding remarks:

In summary, periods of personal doubt, audience responses, colleagues who are enthusiastic, overwhelmed, intimidated, critical or ill-willed are among the subjective realities that enter into a great performing artist's legacy. All the above relied on subjectively experienced perceptions that identified them as interpreters of the Horowitzian experience. The inclusion of their interpretations in the legacy is a telling comment on the power of a great communicator to emotionally work an audience up into a collective cheering team. But it is important to emphasize that in the long run subjective evaluations of audience responses must ultimately be confined to specific measures of authenticity.

With the above in mind the discussion will now shift from the stage experience to a consideration of the responses, evaluations, and conclusions of a first time comparative performance analyst. The discussion will focus on the balancing act I aimed at in order to achieve a workable entente between the subjective and objective realities that enter into the analytical process.

Reflections on comparative performance analyses

My first experiences with the amplitude, timeline and spectrograph performance representations were a mixture of curiosity and concern about the technical complexities involved in organizing the analyzed details for outside evaluation. My concerns soon

dissolved into enthusiasm. The possibility of finding a satisfying reconciliation between objective analysis and subjective concerns became evident when I discovered how well an amplitude time line graph can accurately measure the amplitudes, overall and internal time lines of a performance. I was impressed by how a graph can be magnified to make comparative representations clear with millisecond precision. An added bonus was a spectrogram that cannot only represent harmonic resonances but can also identify the exact position of every note in the performance.

With a pair of earphones on my head and the graphs before me, I entered the musical worlds of Horowitz, Argerich, Cortot, Rubinstein and three dozen other recorded pianists, past and present. I soon found myself simultaneously experiencing their performances as a pianist and deciphering them as an analyst. I could hear, see and examine every performance as it unfolded before me. I could identify millisecond distinctions in detail. I could freeze them and compare them with what preceded and followed from them in the musical line. I could ask questions. I could seek answers and test them with mini second precision across the repertoire. And I could repeat the procedure interminably.

Micro-timed "as if " explorations

As I continued my explorations it occurred to me to read the representations as if they were notated scores on the move. I wondered whether I could expressively direct them by following each pianist's micro-timing from note to note. I soon found myself seeing, hearing, feeling and directing every representation as if I was the pianist notating the score with the mouse in my hand .The more I responded to the sound qualities in each

performance, the more I felt them leading my hands towards a re-creation of the experience.

In retrospect I experienced these explorations somewhat like an actor rehearsing different ways of characterizing a particular role. The actor-pianist role however remained elusive even on the occasions when I got it right.

What came through consistently was how the performances of these superb pianists were precisely nuanced to create experiences that would not have otherwise occurred. My own attempts to conduct the analyses as if I was acting out the performances I heard added further support for the hypothesis that the micro-timed variations of even the simplest motif in repeated performances were specific to the individual pianist.

Take, for example, how Horowitz' s conversational voicings in Träumerei invited me to reflect on the eight subtly different experiences he created out of this familiar work. And how comparative analyses showed that every one of his eight performances shared micro-timed expressive details that were absent in the performances of the four other celebrated pianists.

Or take the mournful, heart wrenching tone that Horowitz produced in the opening passage of the Funeral March from Fryderyk Chopin's B flat minor Sonata. I could not shake off the grip of his tone on the musical line every time I returned to analyze and compare his three performances of the Funeral March. It enveloped the martial beats from the opening measures to the cantabile interlude in a gloomy mist that left little to suggest that Horowitz was paying the usual tribute to a fallen hero. It was rather a gesture of personal sorrow. Most telling was how Horowitz sealed the mood with

his voice leading signature line in measures 82-83 by giving it priority over a distant trilling (tremolando) drum roll. Every other pianist analyzed reversed the procedure: the drum roll was emphasized over an accompanying voice line. Only the persistent church bell effect in Shura Cherkassky's single performance came close to the mood of personal loss suggested by Horowitz (Cherkassky, 1982).

Or how Horowitz transformed the arpeggiated peaks in Rachmaninov's Prelude in g# minor op.32 No.12, from a consistently repeated harmonic reference to voice leadings that brought different perspectives to the musical line in each of his five successive performances. Despite this shift from a harmonic to a contrapuntal perspective every resulting experience remained true to what Horowitz called the "spirit of the music" (cited in Frost T. 1987, p.12). It is inconceivable that Horowitz could have created these precisely varied experiences without an expressively directed sensitivity to millisecond distinctions.

Shura Cherkassky's rollicking performance of Rachmaninov's Polka de W.R. showed how a notated dance could be transformed into a comic masterpiece with micro-timed shifts in tempo, accent and pauses. The experience was so tongue in cheek funny that the audience broke into laughter at Cherkassky's surprise pause a mini-second before the final down beat (Cherkassky, 1979). Not one of the other pianists including the composer played the polka from a similar perspective. Yet Cherkassky's performance was entirely in the lighthearted spirit of the dance. Anyone who has danced to the two beat rhythm of the polka would immediately recognize the fun that comes with the experience.

The blending of representation with my direct experiences as a performing musician had become a productive means for cross-disciplinary analyses.

Here the discussion will turn to the database that was established to store documentations for reference outside as well as within the main stream of the thesis. These include archival materials: summary comments on the overall balancing act and suggestions for future research into the untapped potential of expressively directed micro- timing.

The discussion will begin with brief comments on the performance practices and compositions of early 20th century pianists.

The Database: Early 20th Century performance practices

As references for the database, I analyzed a number of examples of performance practices by pianists who succeeded the 19th century composer-pianists (roughly 1920-1950). These pianists played for the most part with an expressive freedom that is no longer the norm. They favored deviations from the notated tempo and dynamics, arpeggiated sequences of chords and voicings that entered slightly ahead or behind the beat. The details were expressively directed and micro-timed to create musically balanced phrasings. The aim of these deviations from the notated score was clearly to have more options at hand for individual expression. In this regard, embellishment at the time was fast going out of fashion. Yet Alfred Cortot (1930), Simon Barere (1934) and Benno Moiseiwitsch (1958) thought nothing out of line about adding their own cadenzas to, for example, the final measures of Franz Liszt's Leggierezza. Listening to these recordings

makes one wonder at the expressive ingenuity of performing artists who persist in going their own way.

Compositions by early 20th century pianists

I also analyzed a small number of recordings for the database of piano works composed and performed by 20th century concert pianists during the first stages of their careers. These included works by Sergei Rachmaninov, Vladimir Horowitz, Yves Nat and Ignaz Friedman. The compositions interested me for what they might show about the signature voices of these superb performing artists. I checked out commercial and archival collections without much luck. As it turned out scores were almost completely absent. Horowitz, for example, never published his compositions because he believed they weren't good enough. The six recordings I received ranged from Rachmaninov (1919) playing a piano transcription he composed of his song Daisies to a recording by Horowitz (1928) of his familiar Variations on Themes from Carmen and a one-time recording (1930) of his Danse Eccentrique. The remaining early recordings included an album of two character dances by Ignaz Friedman (1927) and one character piece by Yves Nat (1929).

The compositions are well-crafted miniature gems. I was particularly impressed by the youthful playfulness that I heard in every performance. Horowitz's one time performance, for example of his unpublished Danse Eccentrique is a hilarious quick moving polka-like work full of surprises, syncopated rhythms and suggestive voice leadings. Horowitz plays it in 2:34: which happens to be the exact overall time of his Carnegie Hall (1965) and Vienna (1987) recordings of Träumerei.

Database: Avoiding the risks—a closer look at perfect recordings, perfect ears, perfect environments and perfect pianos

The constrictions that come with representations of a highly accomplished performance go beyond a singing tone and the nuanced shadings that elude expressively directed micro-timing. They are equally embedded in the widely held assumption that expressive risk can be avoided with a perfect recording for perfect ears in a perfect environment and a perfect piano. The constrictions begin with the recordings themselves. These include the limited ability for any recording to provide a perfect replica of what has been played. Even with the best equipment and most sensitive editing it is highly unlikely that all internal or external sound interferences will be eliminated. In effect, there are no acoustically perfect halls or studios. Neither is there any foolproof technology capable of accommodating all the environmental contingencies involved in the recording of a piano solo or ensemble performance. Or for that matter can a comparative analysis between recorded performances on different pianos be guaranteed to provide a complete representation of a pianist's or composer's musical intentions (see Chapter 3).

A recent Zenph album of what the producers called " re-performances" of Rachmaninov playing his own early recorded works (1922-28) touches on the issue of a composer/ pianist's intentions. The company claims the " re-performances" were engineered to capture every nuance, including those not evident, of Rachmaninov's original monophonic recordings. The claim has yet to be tested (Harrison, Larkin & Walker, 2009,pp7-12).

Database: risking all for self-expression—revival of the composer/pianists

Self-expression in one form or another has always been part of the musical performance scene. The performances of every contemporary pianist analyzed for the thesis study showed measurable evidence of self-expression in the distinctions between their performances of the same work. Some, notably Glenn Gould, turned expressively directed editing into an individually focused art form. Films stored in the database show Gould rehearsing his efforts with conducted gestures that are clearly intended to precisely time every edited detail.

Neither have the composer/pianists entirely disappeared. A case in point is Marc Andre Hamelin. Robert Rimm sees parallels between Hamelin's masterful recordings, compositions and arrangements with those of the late 19th and early 20th century composer/pianists. These include the monumental risks involved in the works of Alkan, Busoni and Godowsky (Rimm, 2002).

Hamelin's compact disc of jazz pieces composed by 20th century concert pianists is an example of his dedication to a contemporary revival of the composer/ pianist (Hamelin, 2007). Every piece is fully notated with the exception of one by Alexis Weissenberg, that Hamelin completed from a Weissenberg recording. All are complex works that demand sensitivity to the expressive subtleties that distinguish jazz from every mode of classical music. With little room for improvisation, Hamelin takes off with a swinging beat that is equal to the best jazz pianist.

The balancing act: a critical look at the score

The balancing act was an intriguing learning experience; different from anything I had previously learned as a piano student, concert pianist and teacher. As a student, I would often sit in the front row at a concert with the score in my hand listening to what a celebrated pianist might bring to the experience that I didn't already know. (see Preface). And how every one of them brought an individual perspective to their performances that was not evident in the score.

I remember these experiences as enlightening, yet more like dreams that surfaced on occasion into the real world to tease me with their musical insights. As a practicing concert pianist I brought more sophisticated interpretations to the experience. Yet the mystery of how a great pianist could extract such strikingly individual experiences out of the same score still eluded me. Juggling expressively directed micro-timings between objective analysis and my personal experiences provided a self-evident clue. The clue came into focus with my observations treating the analytical representations as if they were scores in motion.

The score, as I now see it, is itself an interpretation—a created representation of what the composer heard. In musical terms it can be considered a theme waiting to be creatively varied. The enigma in this sense lies as much in the composer's notation as it does in the novel experiences created by highly accomplished pianists. The analyses show how even the least likely composed "theme" can be creatively varied into a distinctive musical experience.

"The score", as James Webster noted, "contains the truth and nothing but the truth, but not the whole truth" (cited in Taruskin, 1995, p. 185). The same could be said of an experience created by a master pianist that can move one to tears or laughter.

It would appear that inspiration comes for a performing artist in two fundamental contexts: as an opportunity to create or as a challenge. There is the opportunity to creatively vary a familiar masterpiece and there is the challenge of breaking new ground when there is little to work with. For a dedicated artist, they arrive and depart in no particular order of importance.

A signature voice and the creative mind

The signature voice of a great pianist encompasses more generalized terms such as individual, unique, highly accomplished, gifted and genius. The thesis study shows how these qualifications can only be authenticated as a signature by comparative analyses of their consistently repeated features in creatively varied performances. With the exception of Vladimir Horowitz these consistent features were not overtly evident in the recorded performances of any of the other pianist's selected for the study. This may be due to the lack of a sufficient number of repeated performances of the same work over time that would otherwise justify a detailed search for their consistent features.

Summary of comparative analyses: closing reflections on the Signature Voice.

What then can be gained from comparative performance analyses that could be of value for future research? What do the analyses tell us about the signature voice of a

gifted pianist that we don't already know? Is it simply something one feels but cannot be objectively represented?

Yes and no. Yes it cannot be explained totally in purely objective terms. Neither can it be explained *totally* in purely musical terms. No, because it can *be represented* up to a point so that *overt features of a pianist's signature voice can be both logically and musically understood.* Consider for example, Vladimir Horowitz's singing tone and voice leading. These are the two most consistent features of Horowitz's performances. Expressive details in his voice leadings can be represented in exhaustive detail. His singing tone, however, cannot be thoroughly represented. It can only be *identified* in a general sense from its *overt features* as *portamento* (song like) or *parlando* (speech like) (see Chapter 4). The best that can be expected may occur when these vocally inspired articulations are carried by expressively directed voice leadings. The fact that Horowitz had an outstanding command of every conceivable voicing relationship suggests that the subtler details of his signature voice can, to an extent, be inferred.

What conclusions can we then draw from the comparative signature analyses of Vladimir Horowitz, an eccentric poet of the piano? What can we say about Horowitz as a supremely gifted performing artist that qualifies for future research? Could future studies, in the long run, consider the preliminary findings of this thesis as a step towards shedding light on the inner workings of a great performer's creative mind? These questions are not trivial; creativity is by definition a given factor in the uniqueness of a performing artist's signature voice. With the above in mind the following research efforts are suggested for future consideration.

Future studies in Psychology

The emotionally charged experiences inferred in expressively directed micro-timing make it an appropriate consideration for future psychological studies of its role in performance creativity, modes of variability and the individual voices of musical performers. The opportunity for more wide ranging studies in these areas would prove valuable because only two psychological studies to date have considered micro-timing as a viable option for performance analysis. These are the jazz studies conducted respectively by Benadon (2009) and Iyre (2002) (see Chapters 1 and 3). All other psychological studies have relied on generalized concepts of timing and expressivity in musical performance.

From the above perspective the contribution of psychological studies to the role of expressively directed micro-timing in advanced musical performance would most likely be in the following areas.

Ensemble performances: Duos and trios. Future research studies might consider ensemble performances of duos (e.g. between a pianist and a singer) and trios (e.g. between a pianist, violinist and cellist) Studies in these genres would provide interesting opportunities to test a wide variety of micro-timed situations. These include the synchronization of the expressively directed approaches, entrances and exits at the same moment or at different intervals and durations of time. Differences in the timbres of the instruments would bring perspectives to voice leadings and nuances that would not otherwise be available for comparative analyses.

Touch, gestures and sound qualities. Expressively directed micro-timings of incremental degrees of touch and gesture could be analyzed and compared as they relate

to the onset and continuity of tonal durations, amplitudes, degrees of intensity and resonance. Each of these factors could be measured to identify the activation and expressive depth of sound qualities from a comprehensive perspective that has yet to be employed (for example of the singing tone at the piano).

Pattern recognition: modification of auditory identification. Expressively directed micro-timings of minute degrees of auditory identification in pattern recognition might be analyzed from a psychological perspective. There are various micro-timed elements that are specific to the performer that can be measured and modified. One can, for example, electronically modify the performance(s) of an outstanding performer in gradations of sound to a point where the style of playing is no longer recognizable. The research question might focus on the minimum number of incremental modifications of the example that are necessary before the performer (performance) can no longer be identified.

The study might be conducted from a number of perspectives. The most likely first time research effort might be a comparative study of the conclusions arrived at by performing musicians and those of laypersons.

Against the odds: A collaborative interdisciplinary study

A somewhat more ambitious research collaboration between performing musicians, neuro-psychologists, and medical practitioners might be conducted on the role that expressively directed timing plays in situations where a driving need to make music is successful against the odds. There are several possibilities for research. The most productive might be in contexts where the need to play is coupled with the gift, desire,

will and imagination to overcome the apparent limitations of a seriously damaged body, advanced age and the available instrument. One can only imagine how a collaborative study by the above of expressively directed micro-timing might break new ground in situations like the following:

- Halina Szymulska, a Polish soprano afflicted with a non functioning lung and severe scoliosis who was acclaimed as a great interpreter of French Art song;
- Thomas Quastoff, a baritone born with a stunted body without arms, who achieved a world wide reputation as a master of German Art Song;
- Adrian Anatowawa, a superb violinist, born without a left arm who insisted on being fitted with a prosthesis at age nine so that he could play the violin. Presently in his early twenties he tours throughout Canada and the United States performing major concertos to acclaim by colleagues, critics and audiences;
- Evelyn Glennie, a deaf percussionist performing solo and ensemble works worldwide;
- The cellist Jacqueline Du Pré crippled by advanced multiple sclerosis playing a violin for the first time and playing it beautifully "as if " it is a cello;
- Janina Fialkowska, a concert pianist counteracting a negative medical prognosis by successfully overcoming pain and discomfort in order to teach her non-functioning hand how to play the piano. After an exhaustive eighteen-month period Fialkowska was able to train every new working muscle in her arm back to life. She returned to her professional schedule to perform major solo and concerto works in recital;

- The cellist Pablo Casals barely able to move and conducting at age 95;
- The "musicians' pianist" Mieczyslaw Horszowski concertizing at age 100.

  The dancer Doris Eaton Travis performing publicly at age 104.

Micro-timing in fields other than music

Future studies may also benefit from methodologies that focus on long term comparative micro-timed analyses between successive performances in fields other than music. For example, a methodology that compares specific details in the performances of a particular performing artist as well as between the best and the best *over time* in their chosen fields. One recalls the numerous films of the great dancer Nureyev defying time and gravity with his expressively timed twists, turns and leaps in a ronde de jambe. Filmed representations may also provide valuable information on individual differences in expressively directed micro- timing between outstanding athletes.

Concluding remarks: Balancing acts beyond analysis

The necessary conceptions about correct analytical procedures in any art or science must be dealt with from a different perspective under circumstances where their effectiveness might be compromised. It was the underlying desire to have access to a well-rounded perspective that encouraged this thesis to concentrate on reconciling the objective analysis necessary to good science with the subjective experiences necessary to a performing art.

Future studies of expressively directed micro-timing will, in my opinion, contribute new insights into the organization of highly complex human performance.

Questions, however, still remain. And there will undoubtedly be more to come. Such is the subtext of this thesis. And such is the balancing act beyond analysis in every science and art.

The above remains so, even though one can only speculate on what the tearful eyes of a listener tell one about his or her personal interpretation of a musical experience. Neither can one know in exactly what way Horowitz's vision of Träumerei triggered the responses of his audience. What is certain are the poignant images of listeners mesmerized by his performance of Träumerei. Most poignant was the moment of collective silence as the last note faded away before applause brought the mood of shared intimacy to its logical conclusion.

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Horowitz, V. (1986). Prelude in G sharp minor op. 32 No. 12. [Composed by S.

Rachmaninov]. On *The Legendary Berlin Concert* [CD]. Sony Classical 88697604812. (2009)

Horowitz, V. (1986). Polka de W. R. [Composed by S. Rachmaninov]. On *Horowitz in Moscow* [CD]. Deutsche Grammophon 459 052-2GCC Centenary Collection. (1986)

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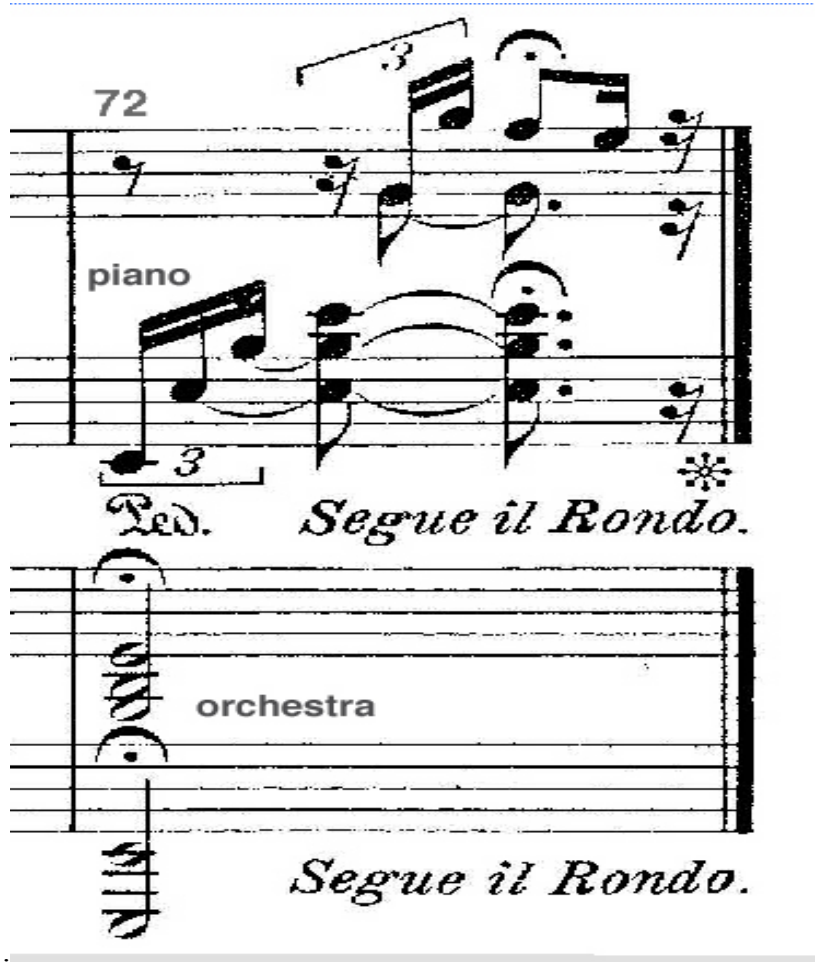
APPENDIX A

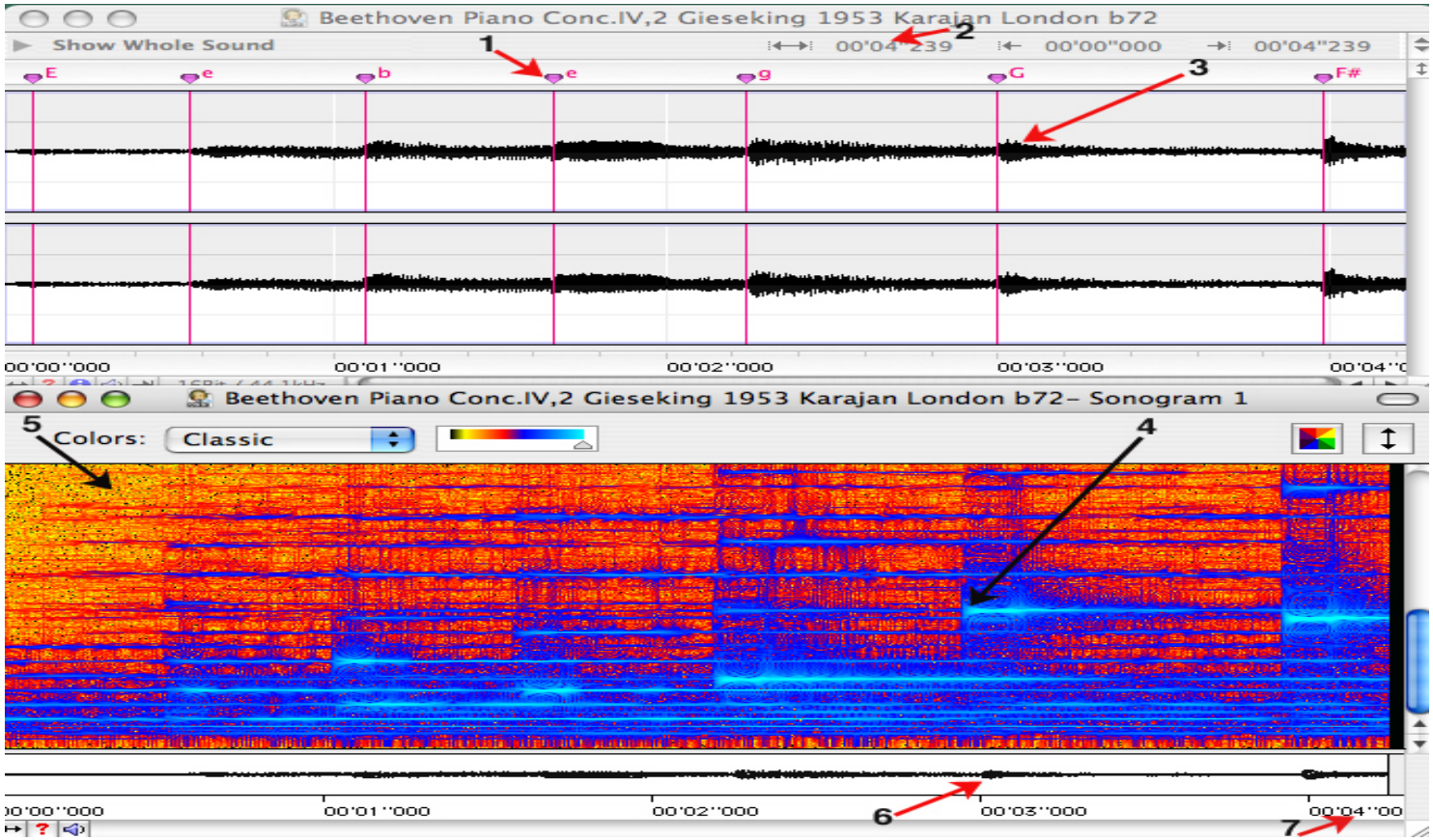
Additional amplitude timelines and spectrograms for

performances of Beethoven Piano Concerto #4

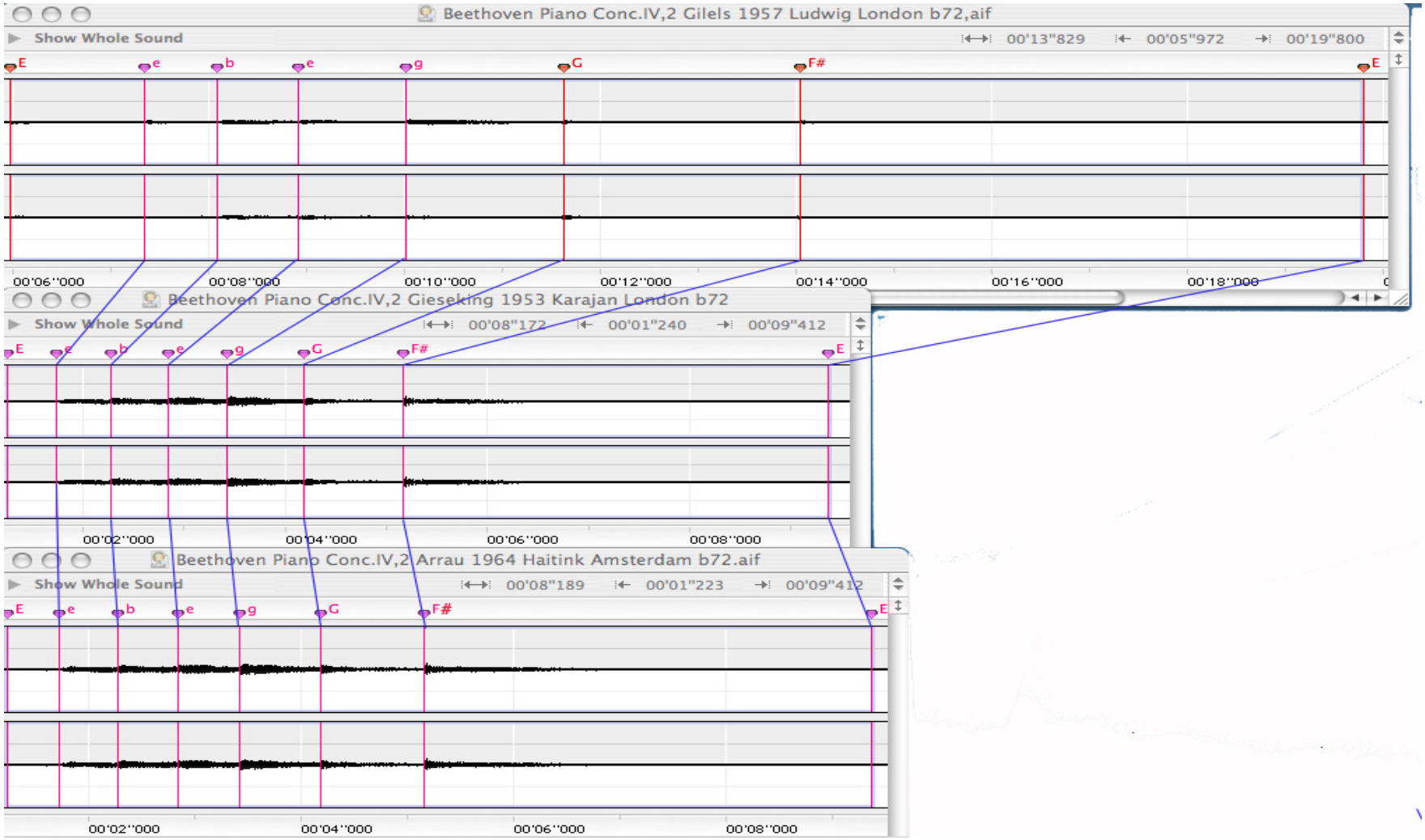


Beethoven Piano Concerto No.4. II Movement, Measure 72

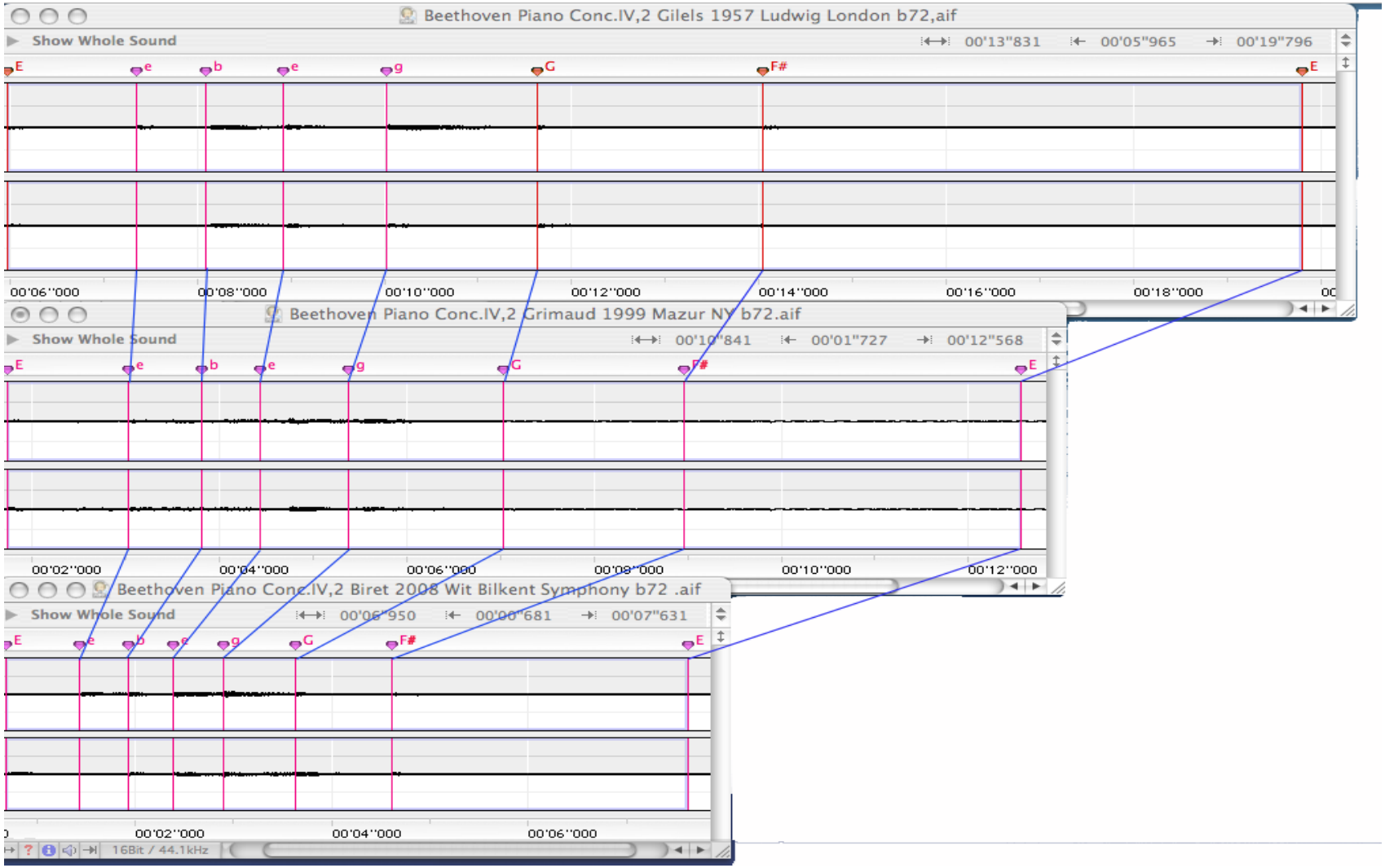
GRAPHS - Legend: Beethoven Piano Concerto No.4. II Movement, Measure 72



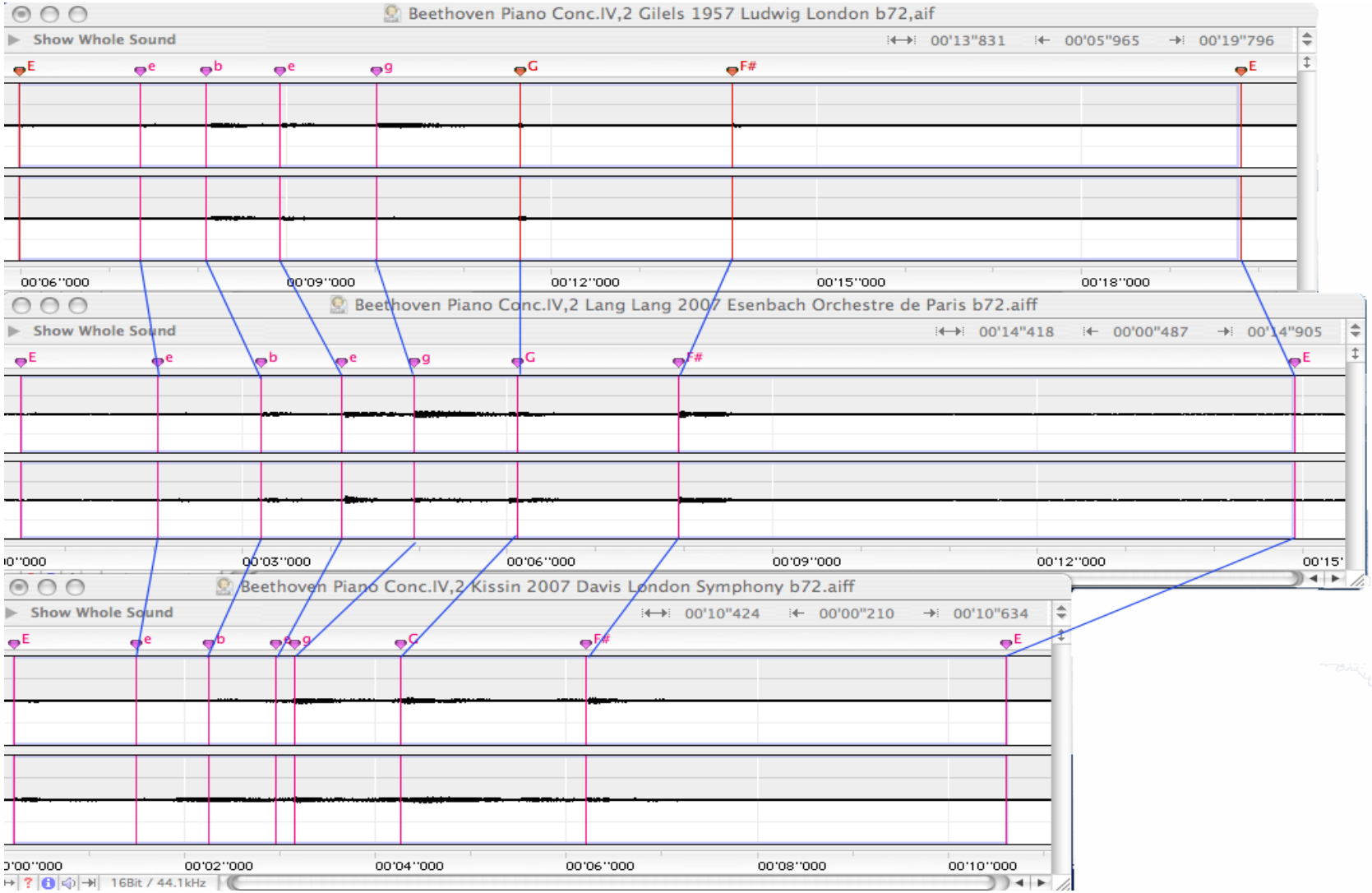
1 Amplitude time- line : timing of a single note-to-note piano entrances of Measure 72. (F#-**F-Sharp)**
2 Overall timing of the excerpt – 00’04”239
3 Amplitude time-line (peak)
4 Spectrograph of the same excerpt: emphasis and duration of a note-to-note attack and its harmonic relationships
5 Background reverberation and/or background noise
6 Amplitude time- lines
7 Overall timing



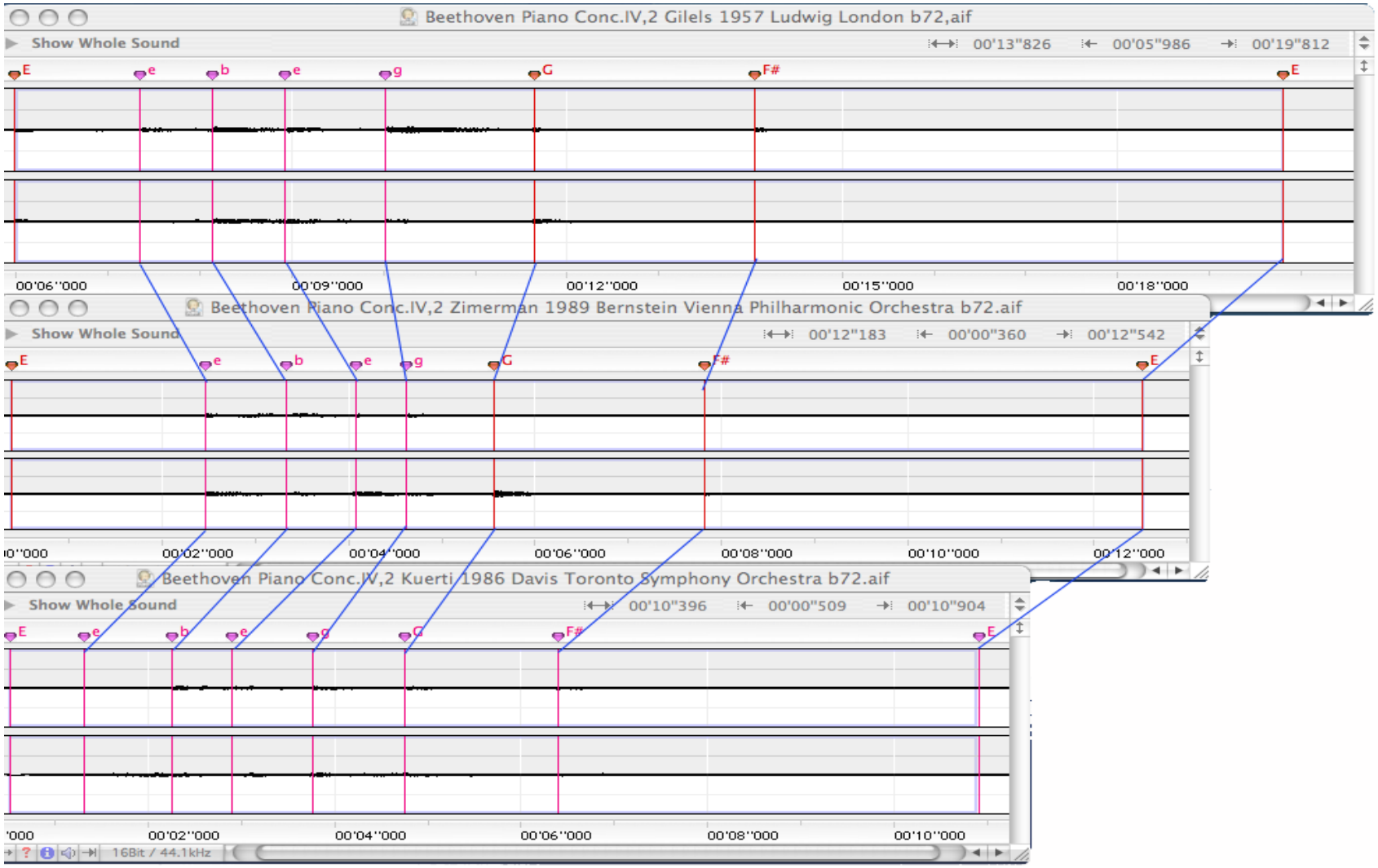
Graph 1 **Amplitude Timeline:** Beethoven Piano Concerto No.4. II Movement, Measure 72 performances by: Gilels, Gieseking, Arrau



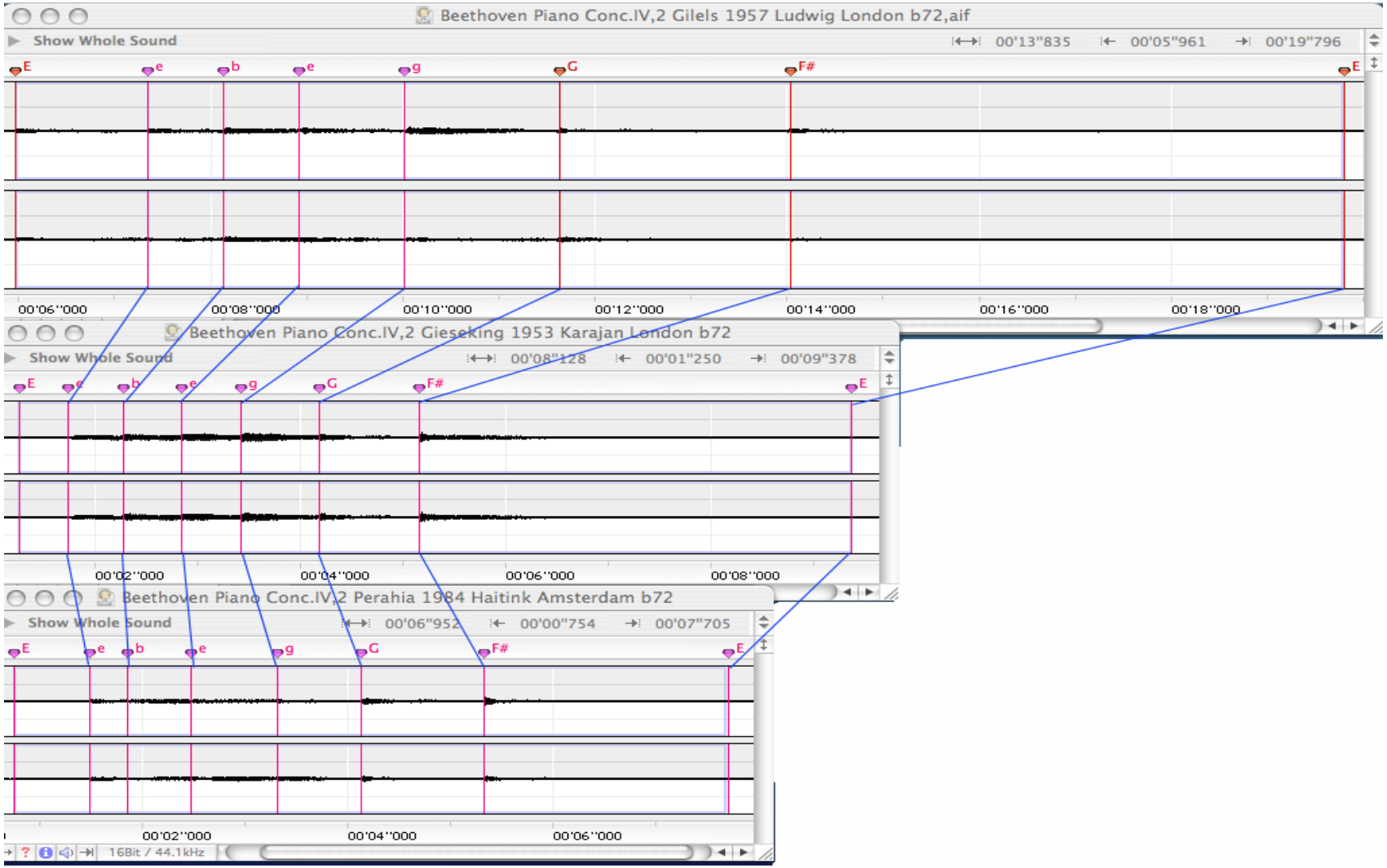
Graph 2.**Amplitude Timeline**: Beethoven Piano Concerto No.4. II Movement, Measure 72 performances by: Gilels, Grimaud, Biret



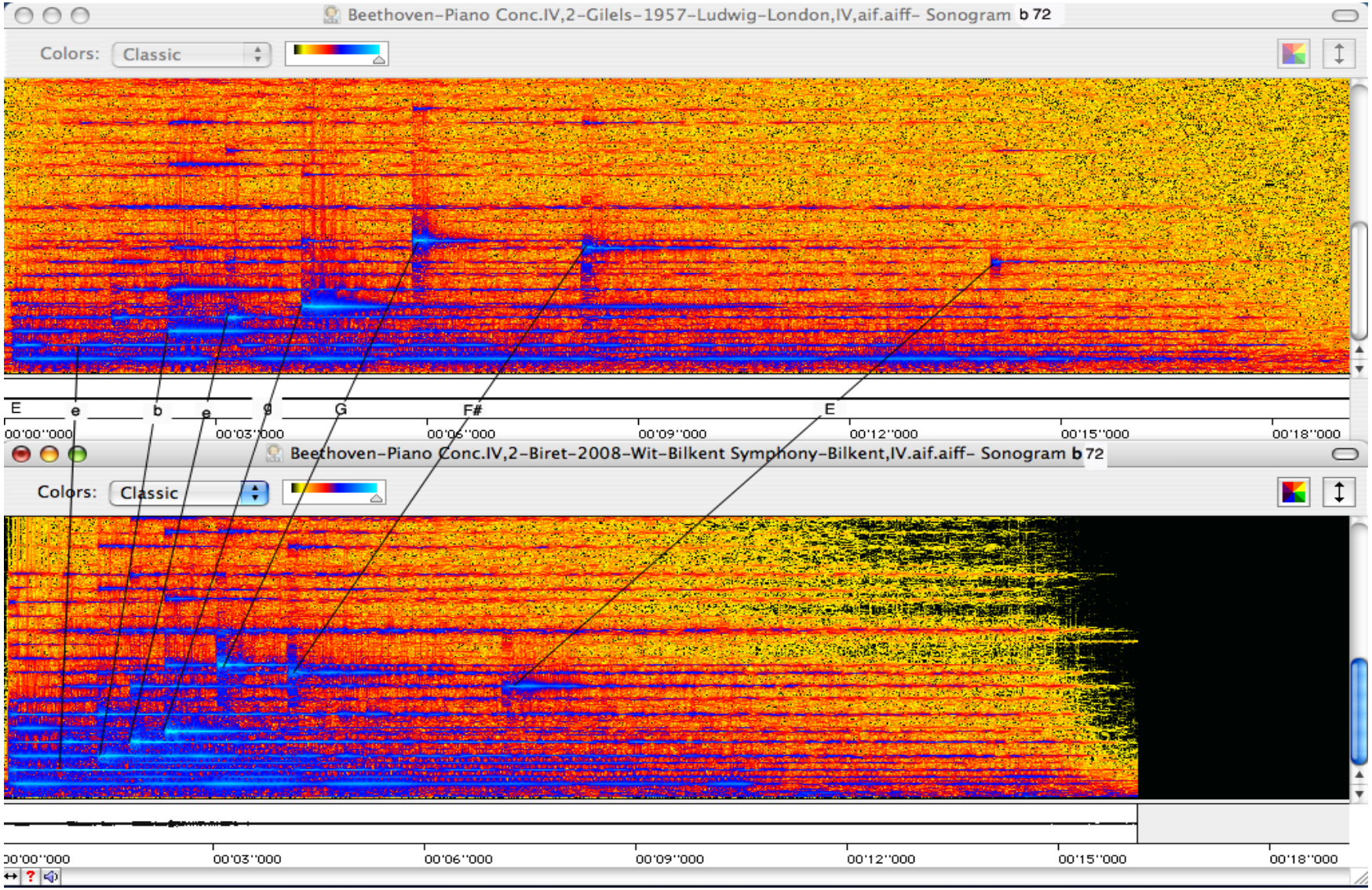
Graph 3 **Amplitude Timeline**: Beethoven Piano Concerto No.4. II Movement, Measure 72 performances by: Gilels,Lang-Lang,Kissin



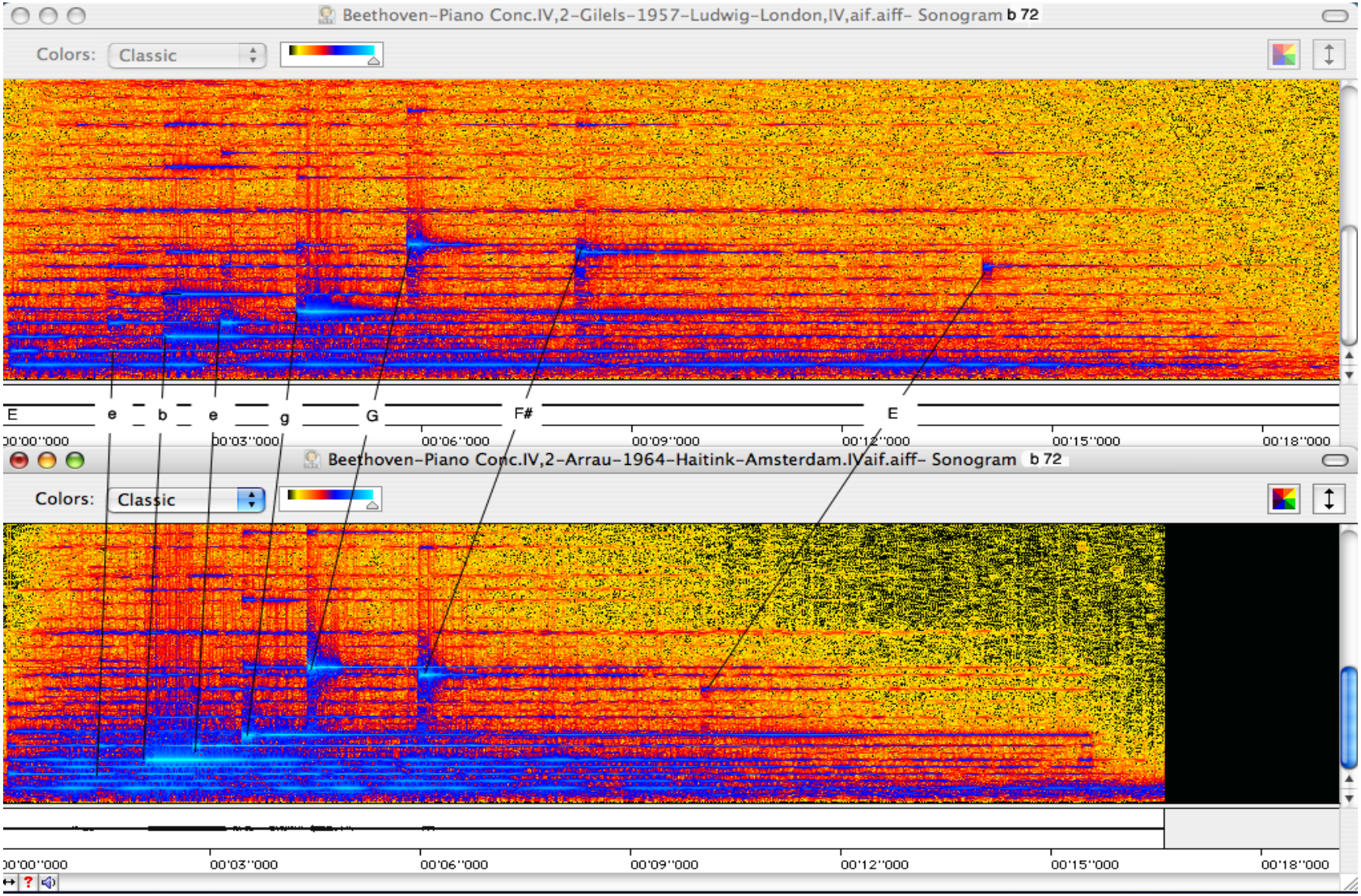
Graph 4 **Amplitude Timeline**: Beethoven Piano Concerto No.4. II Movement, Measure 72, performances by: Gilels,Zimerman,Kuerti



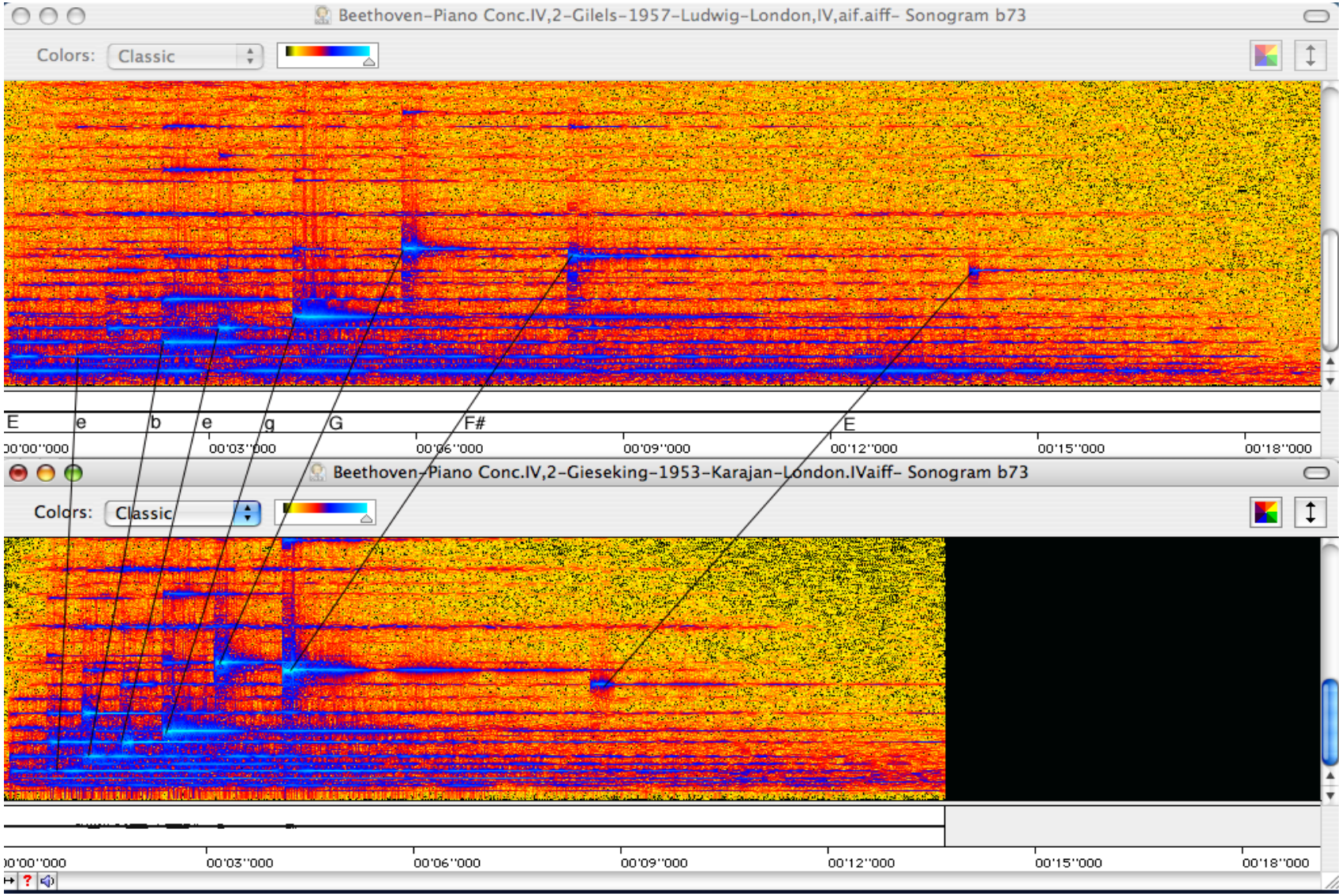
Graph 5 **Amplitude Timeline**: Beethoven Piano Concerto No.4.II Movement, Measure 72, performances by: Gilels,Gieseking,Perahia



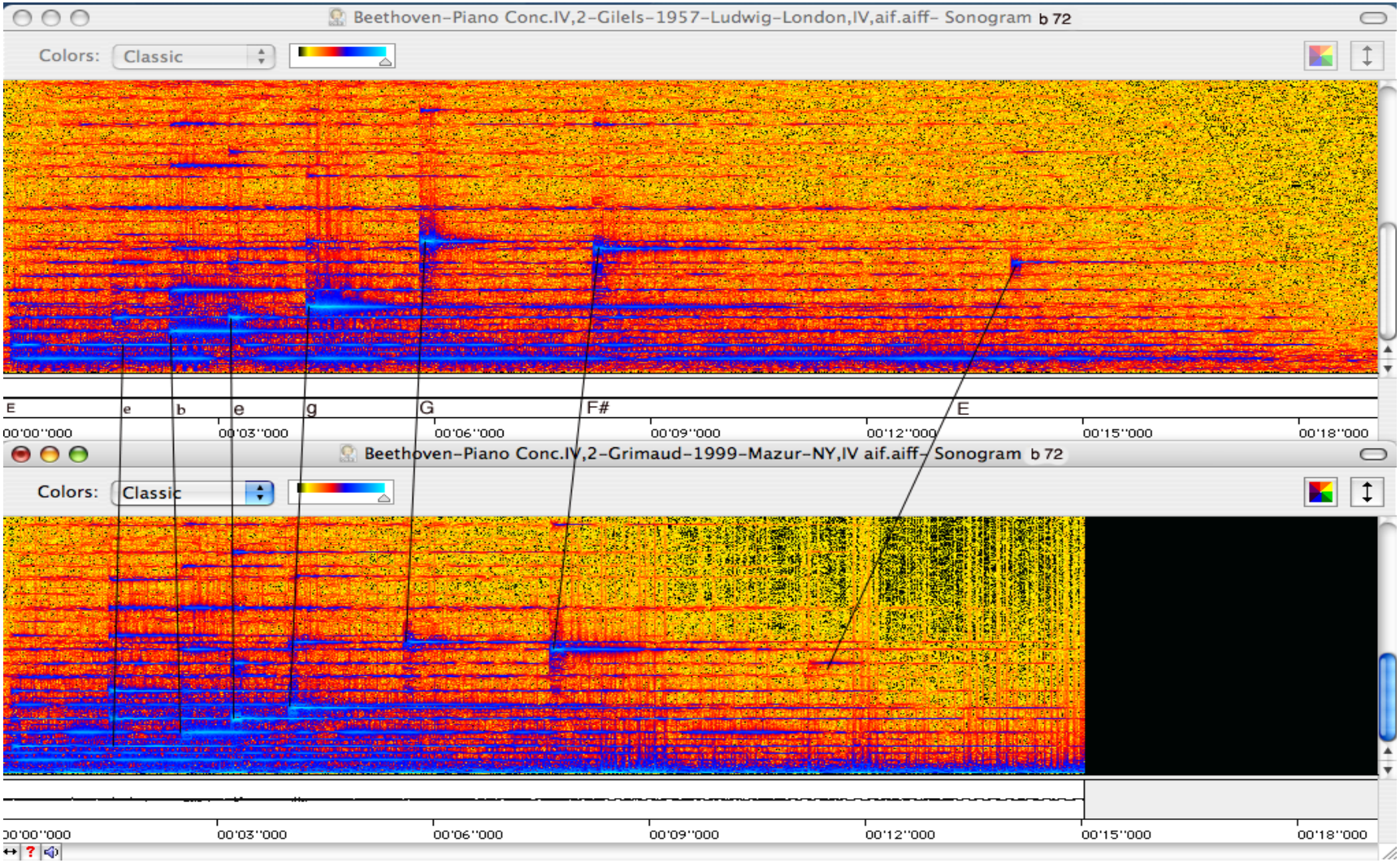
Graph 6. **Spectrograph**: Beethoven Piano Concerto No. 4. II Movement, Measure 72, performances by: Gilels, Biret



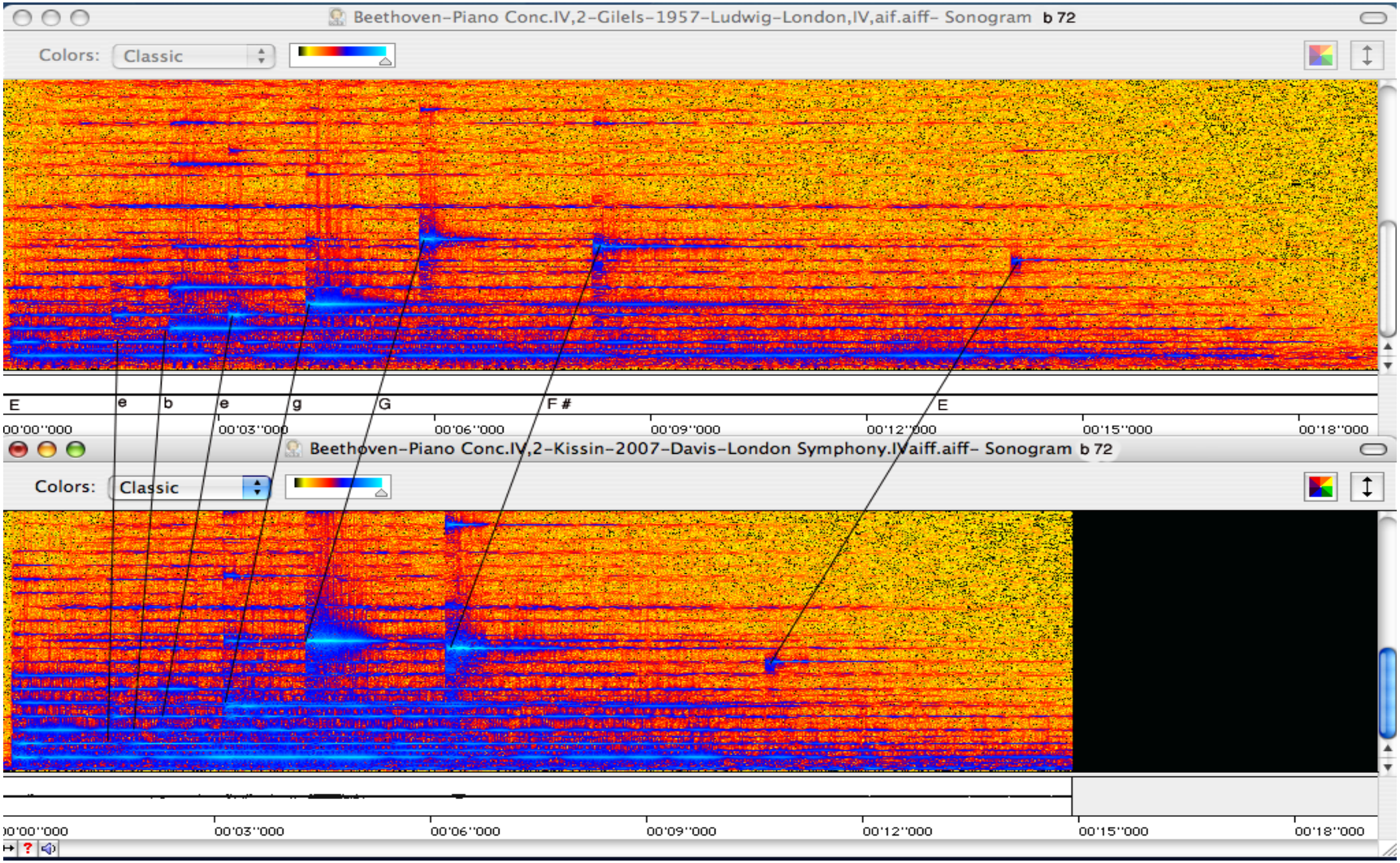
Graph 7 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 72, performances by: Gilels, Arrau



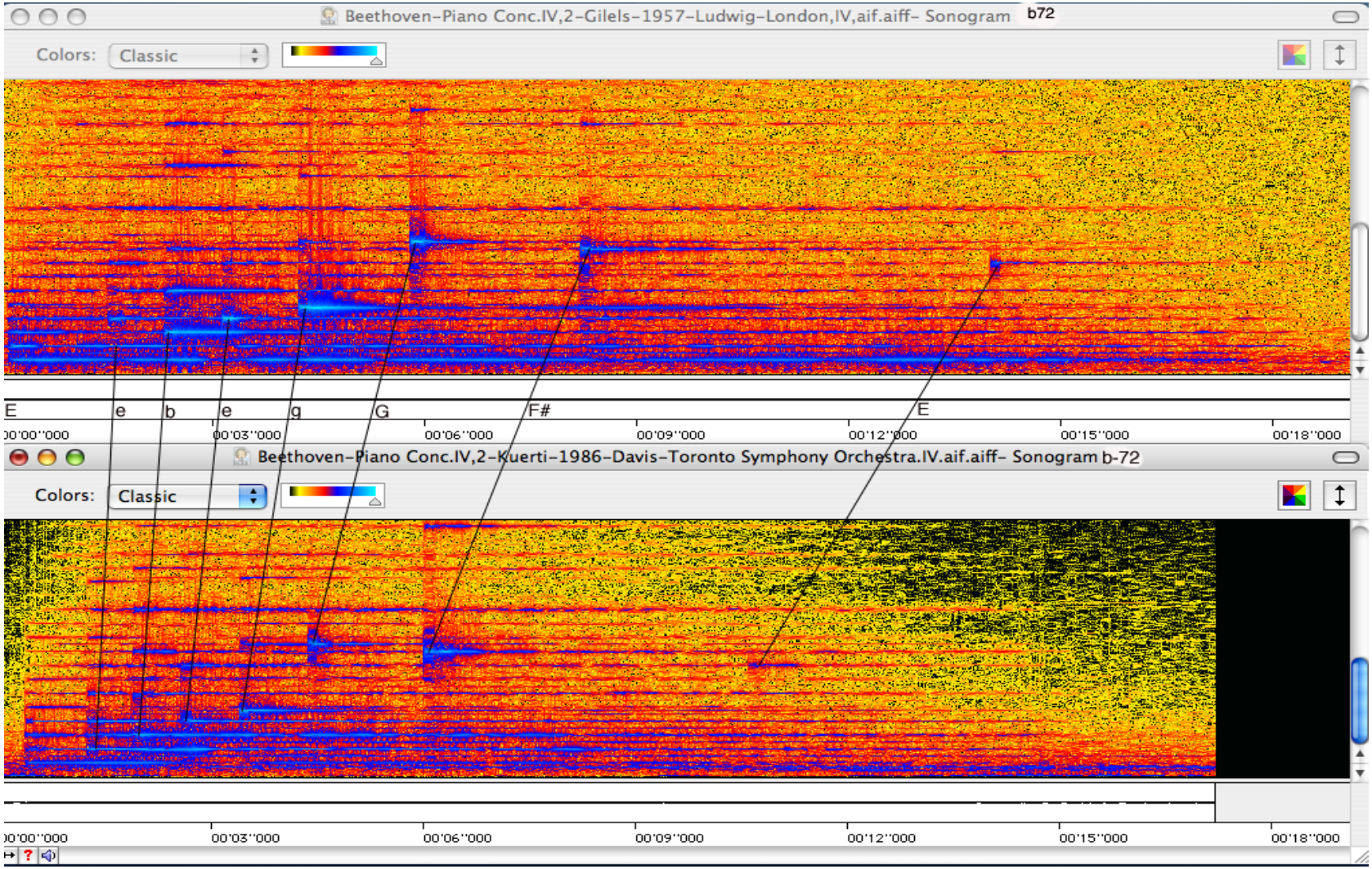
Graph 8 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 72, performances by: Gilels, Gieseking



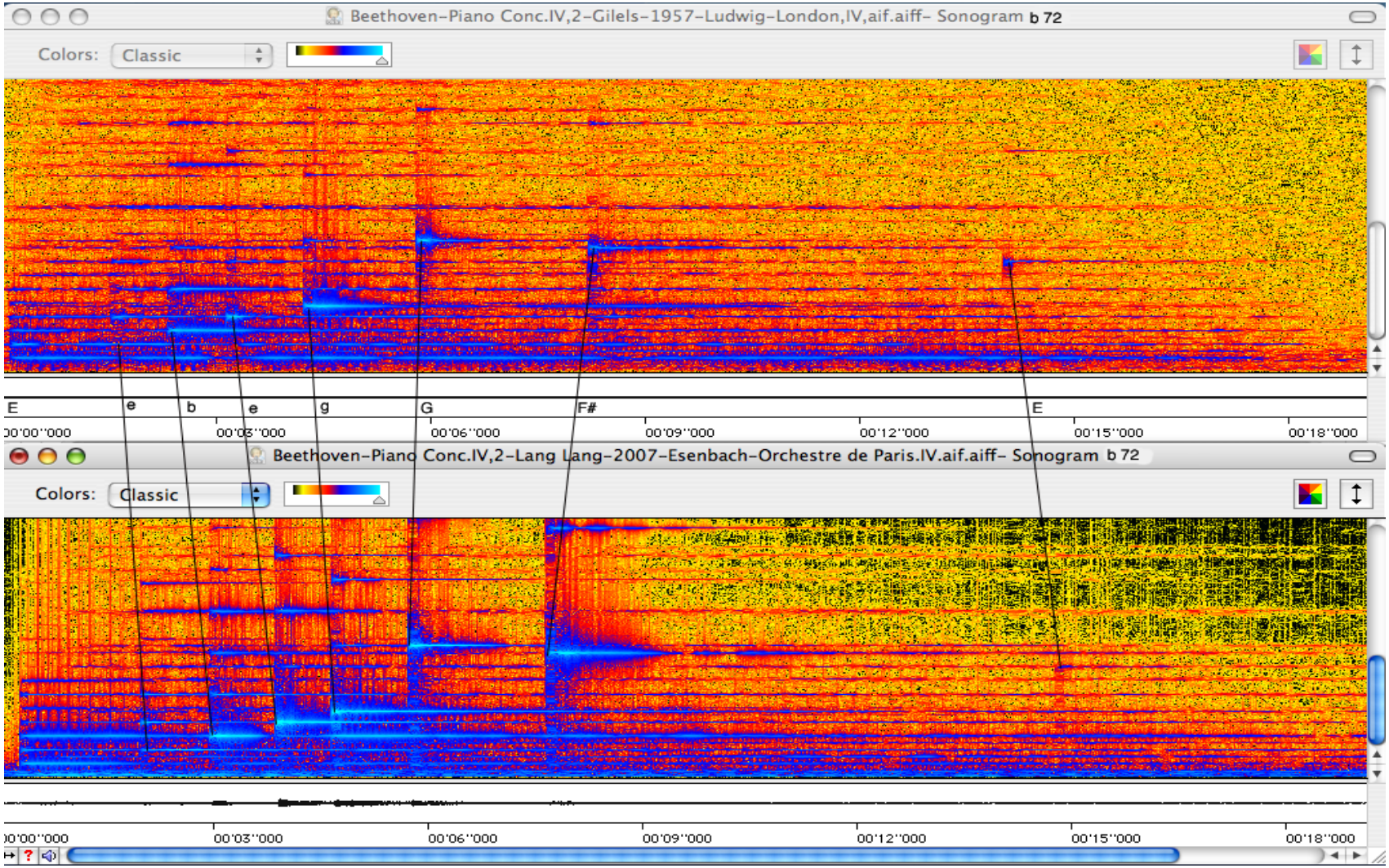
Graph 9 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 72, performances by : Gilels, Grimaud.



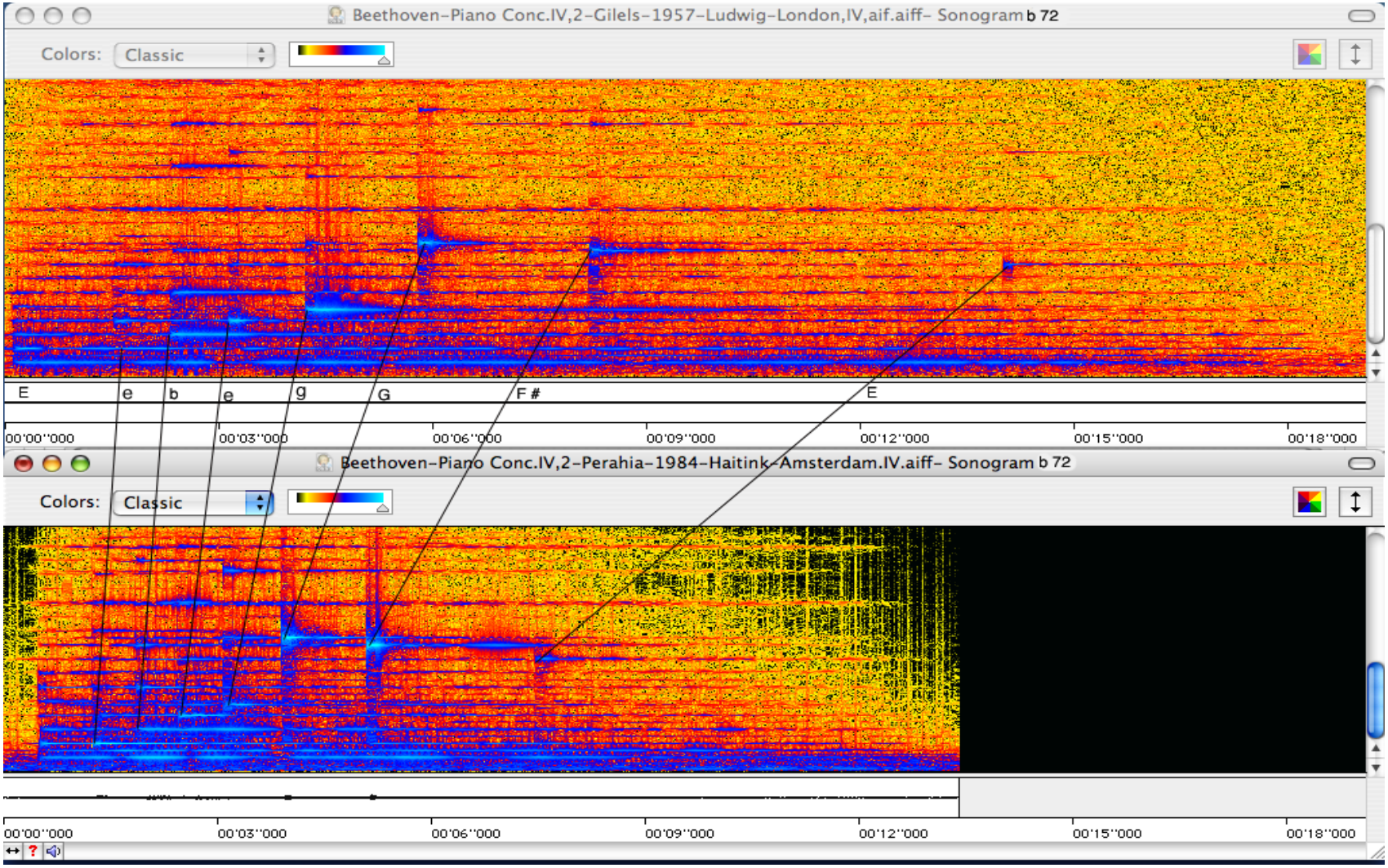
Graph 10 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 72, performances by: Gilels, Kissin



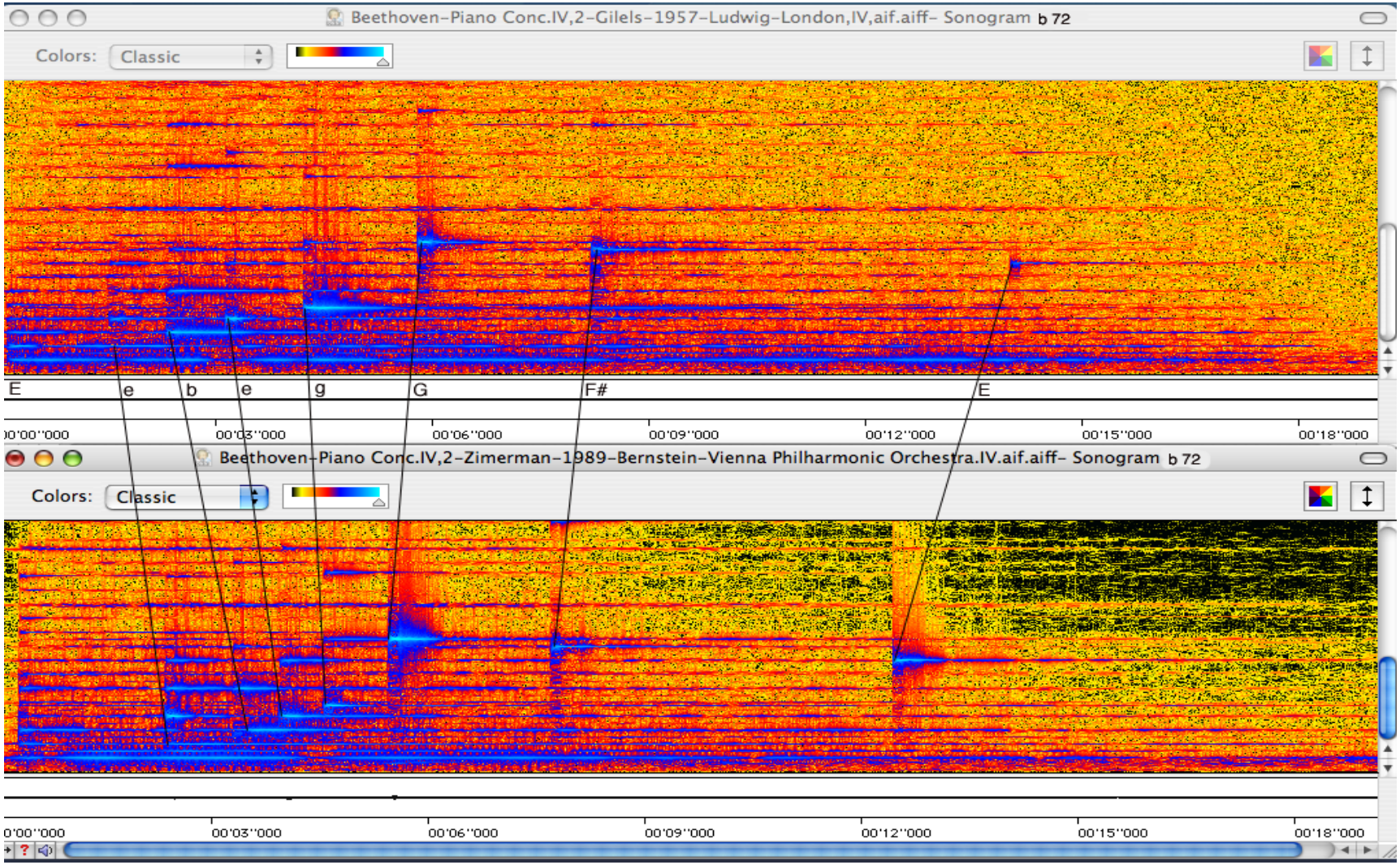
Graph 11 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 72, performances by: Gilels, Kuerti.



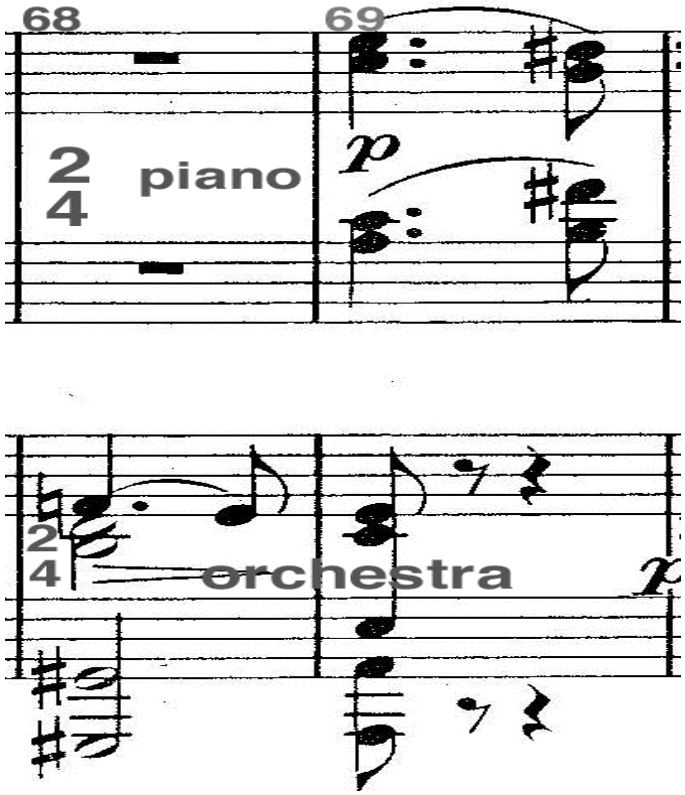
Graph 12 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 72, performances by: Gilels, Lang-Lang



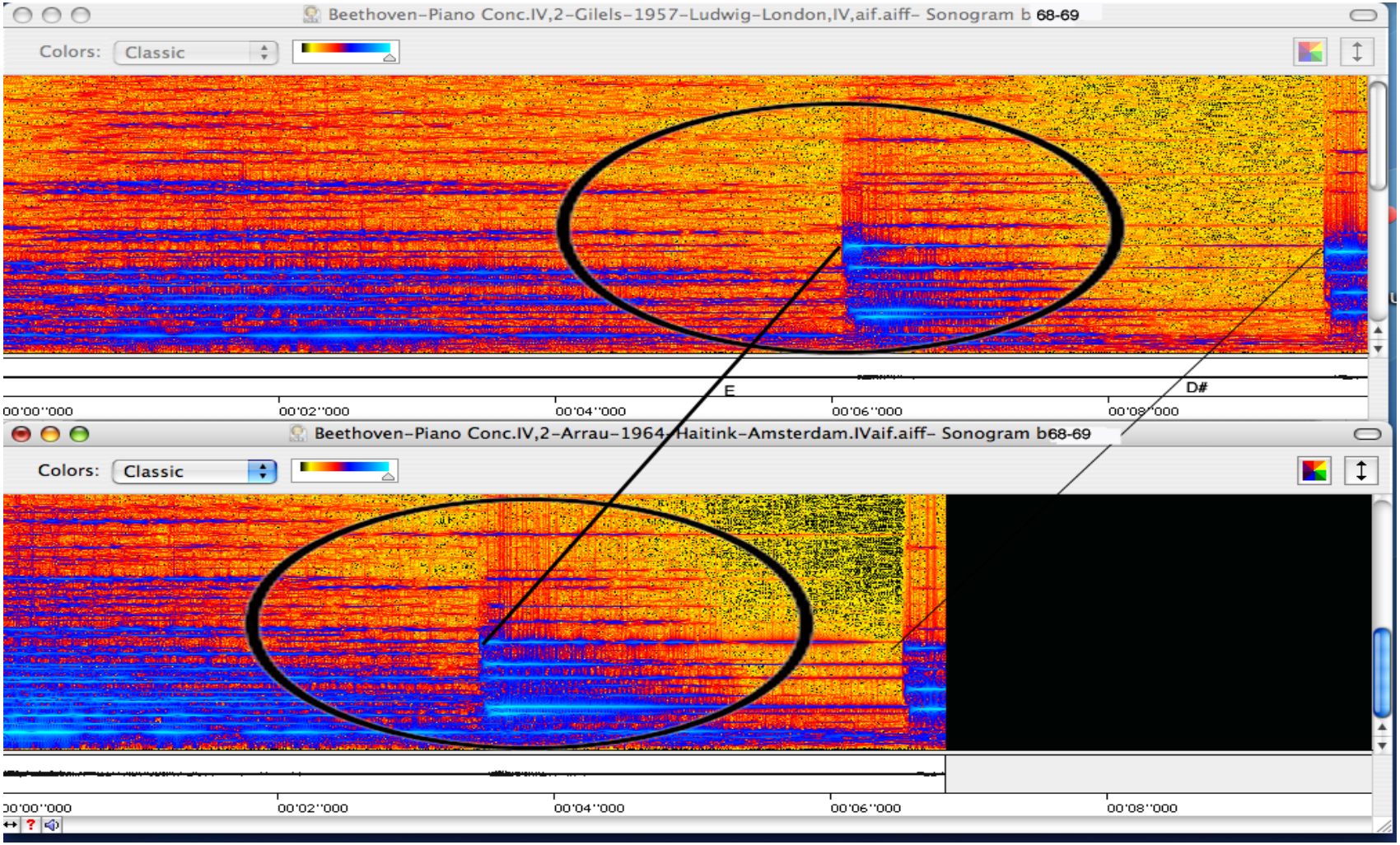
Graph 13 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 72, performances by: Gilels, Perahia



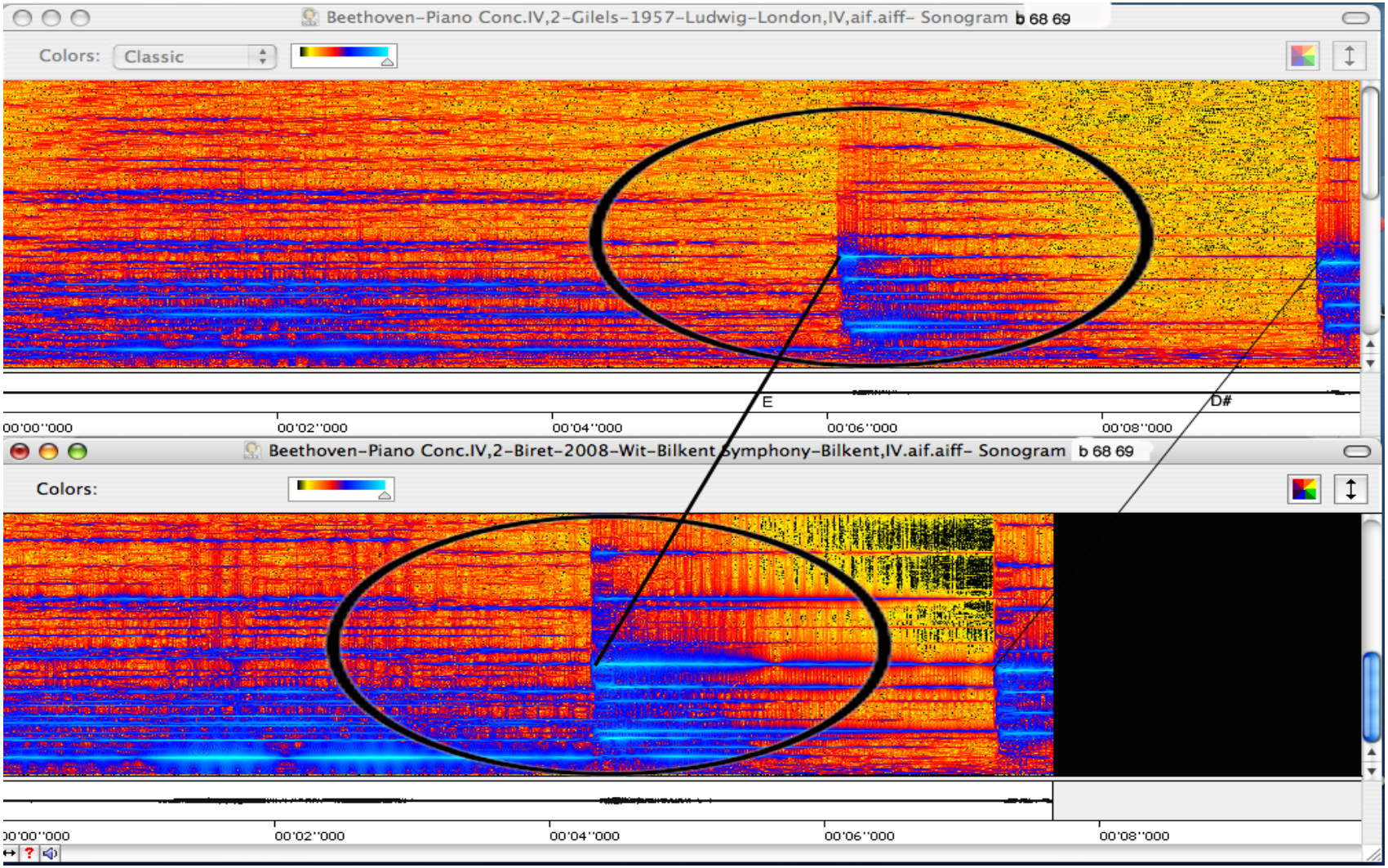
Graph14 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 72, performances by: Gilels, Zimerman.



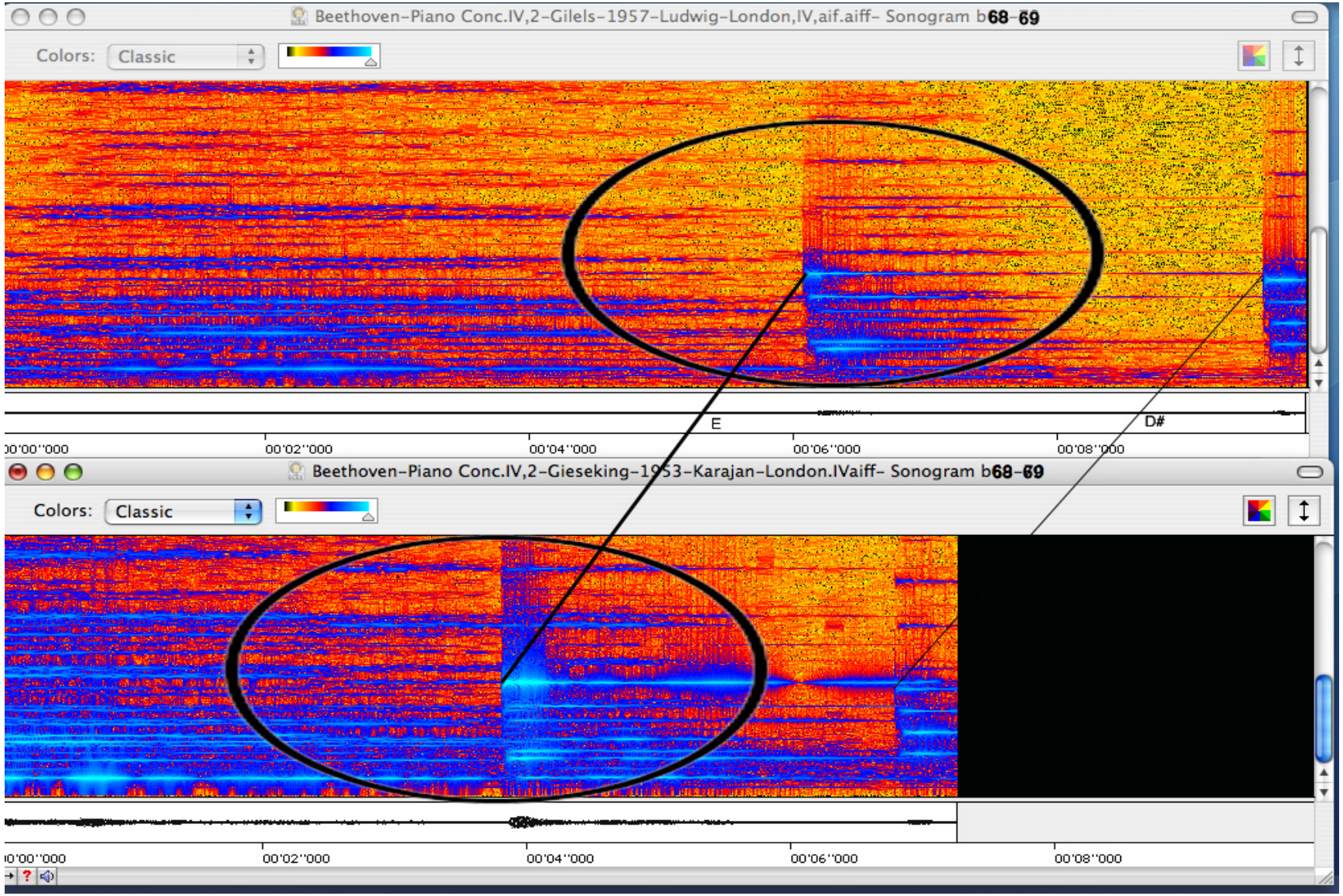
Beethoven Piano Concerto No. No.4. II Movement, Measure 68-69



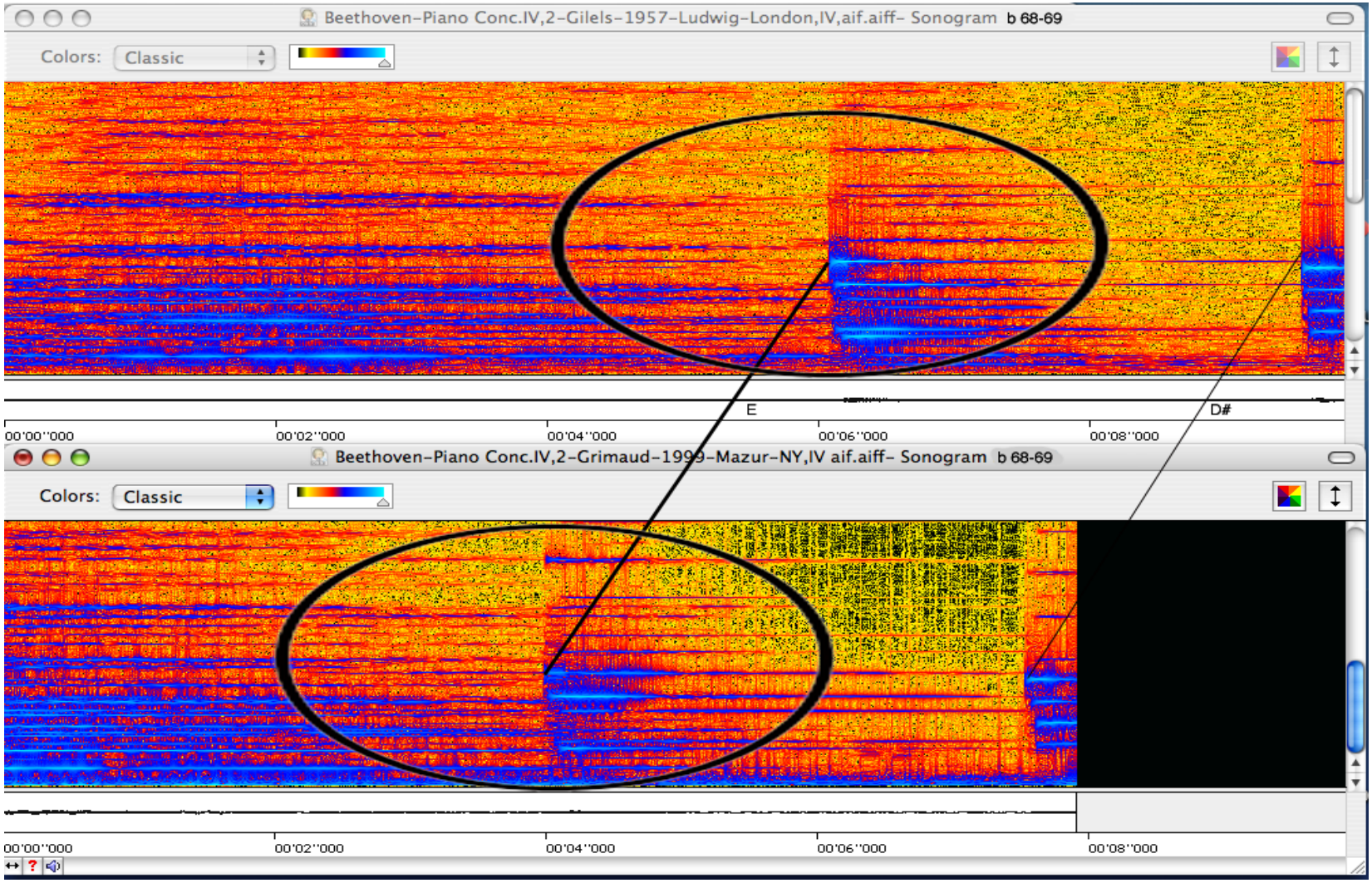
Graph 15 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 68-69, performances by: Gilels, Arrau.



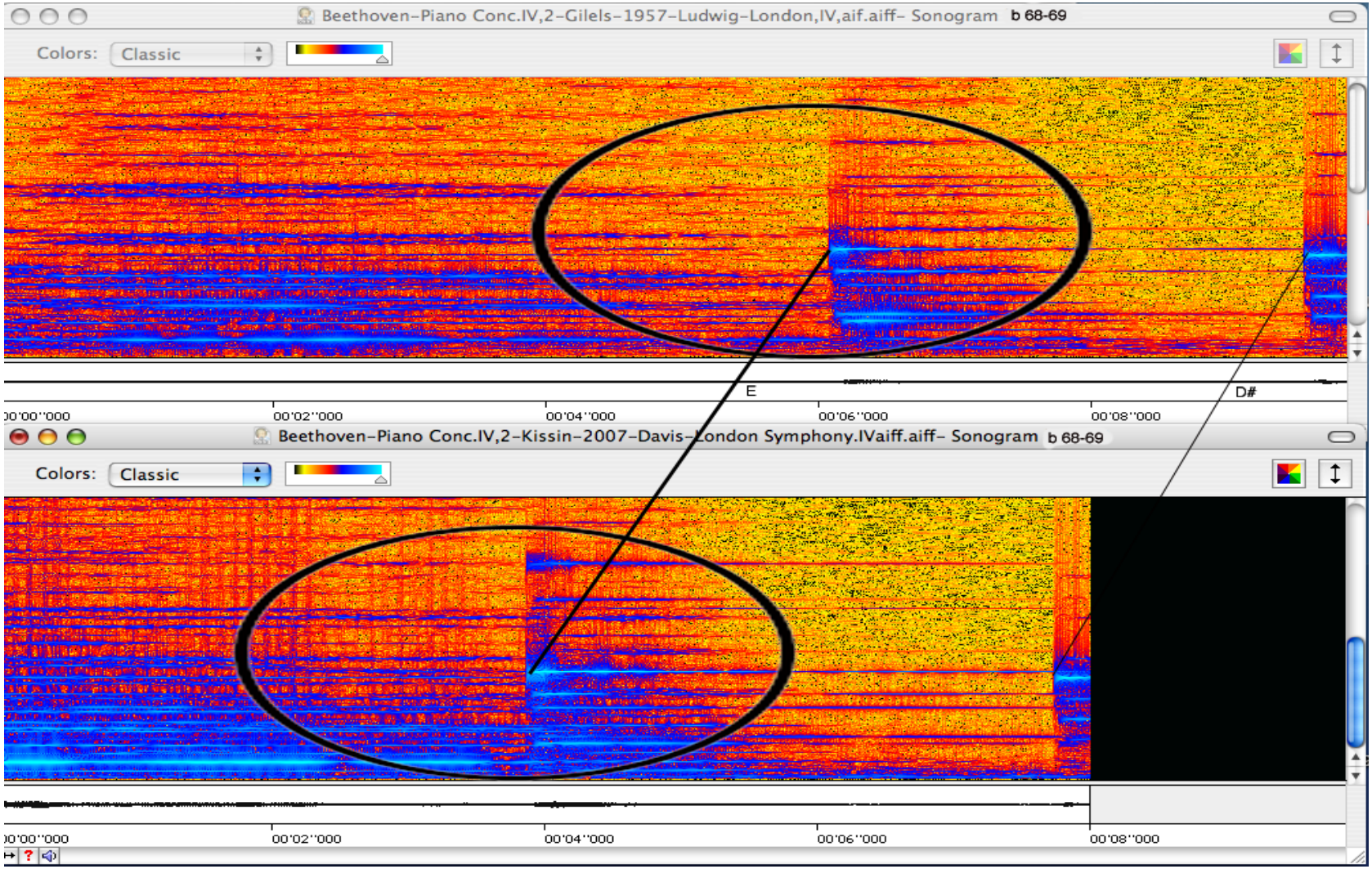
Graph 16 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 68-69, performances by: Gilels, Biret.



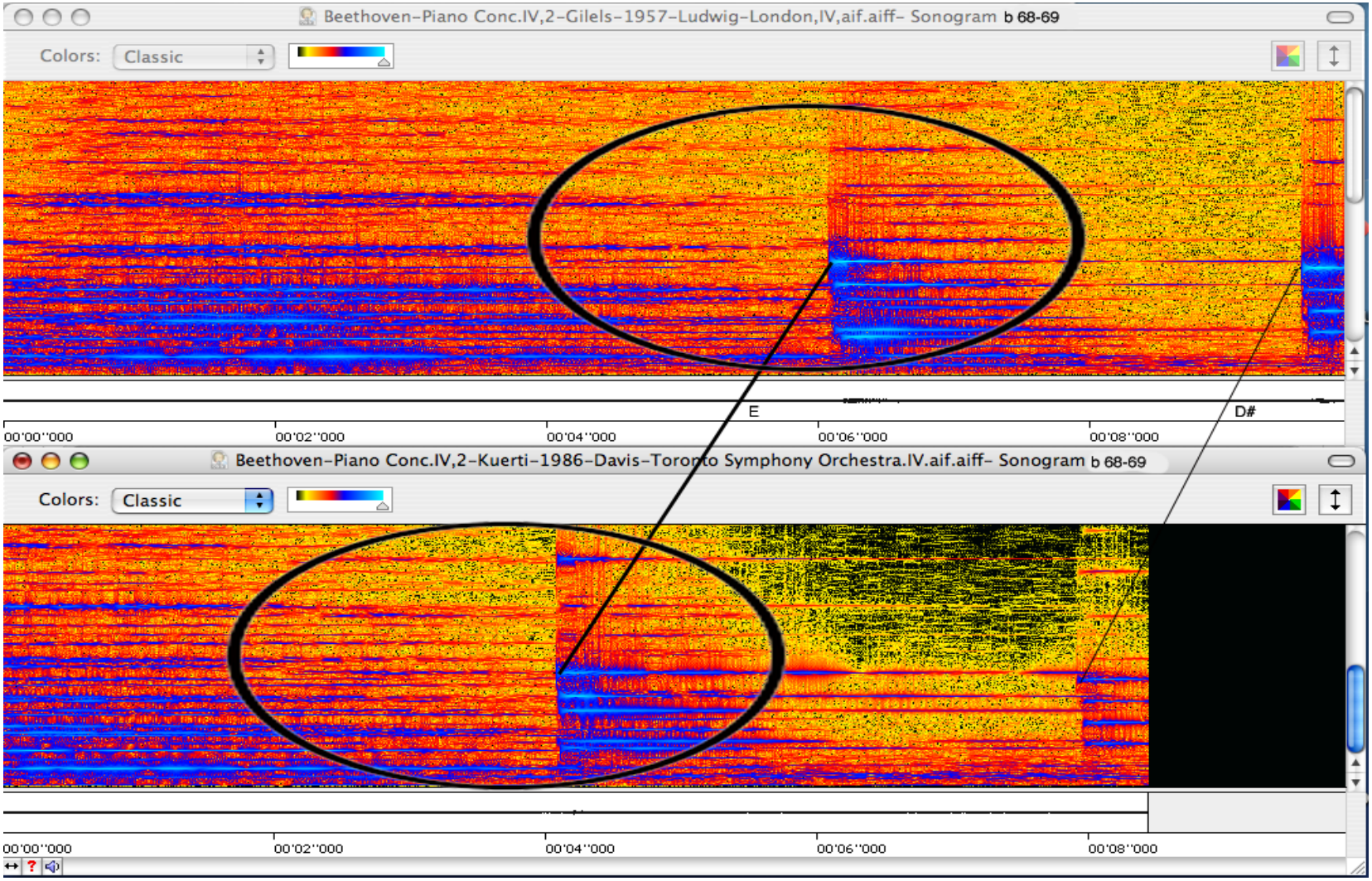
Graph17 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 68-69, performances by: Gilels, Gieseking.



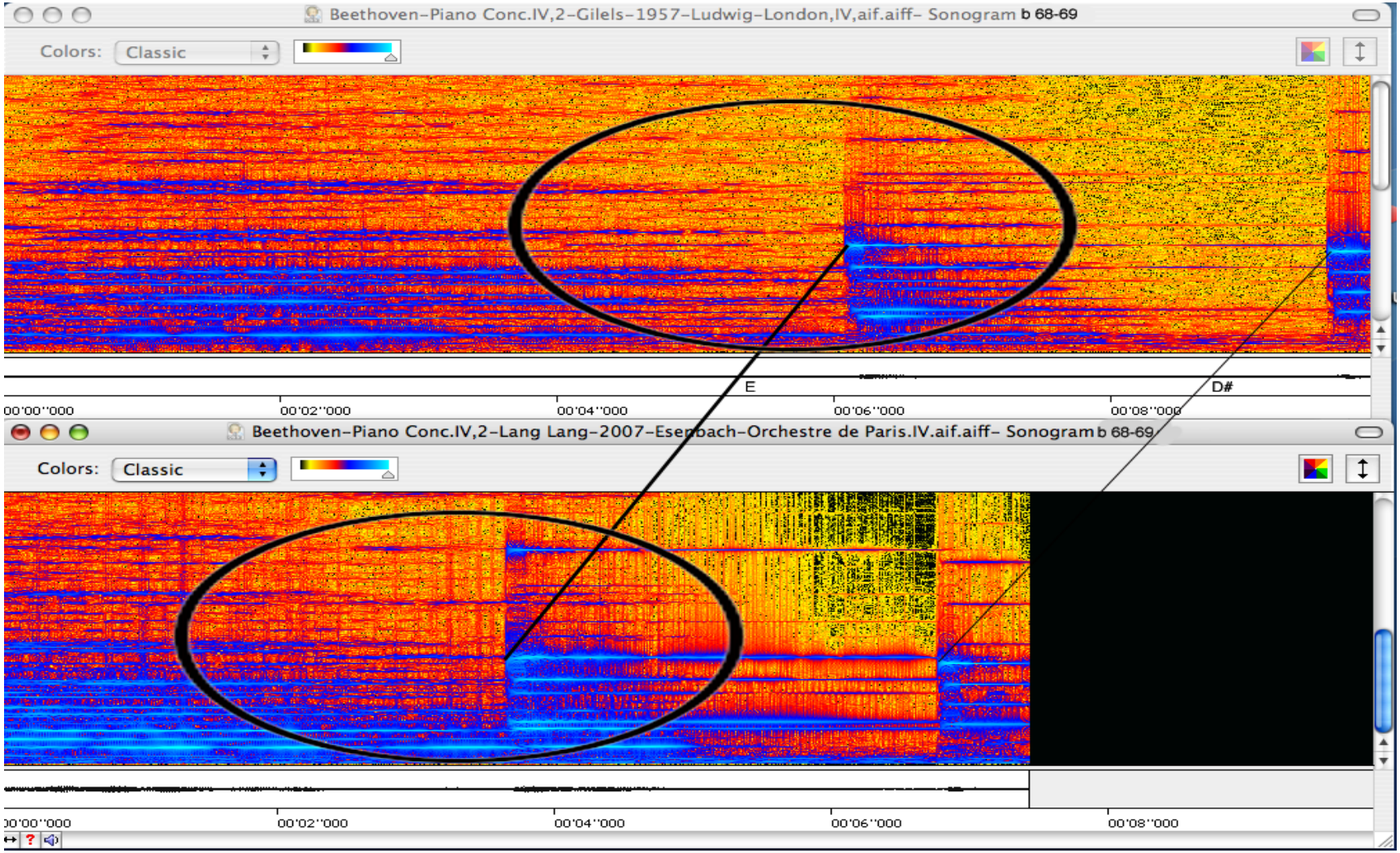
Graph 18 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 68-69, performances by: Gilels, Grimaud.



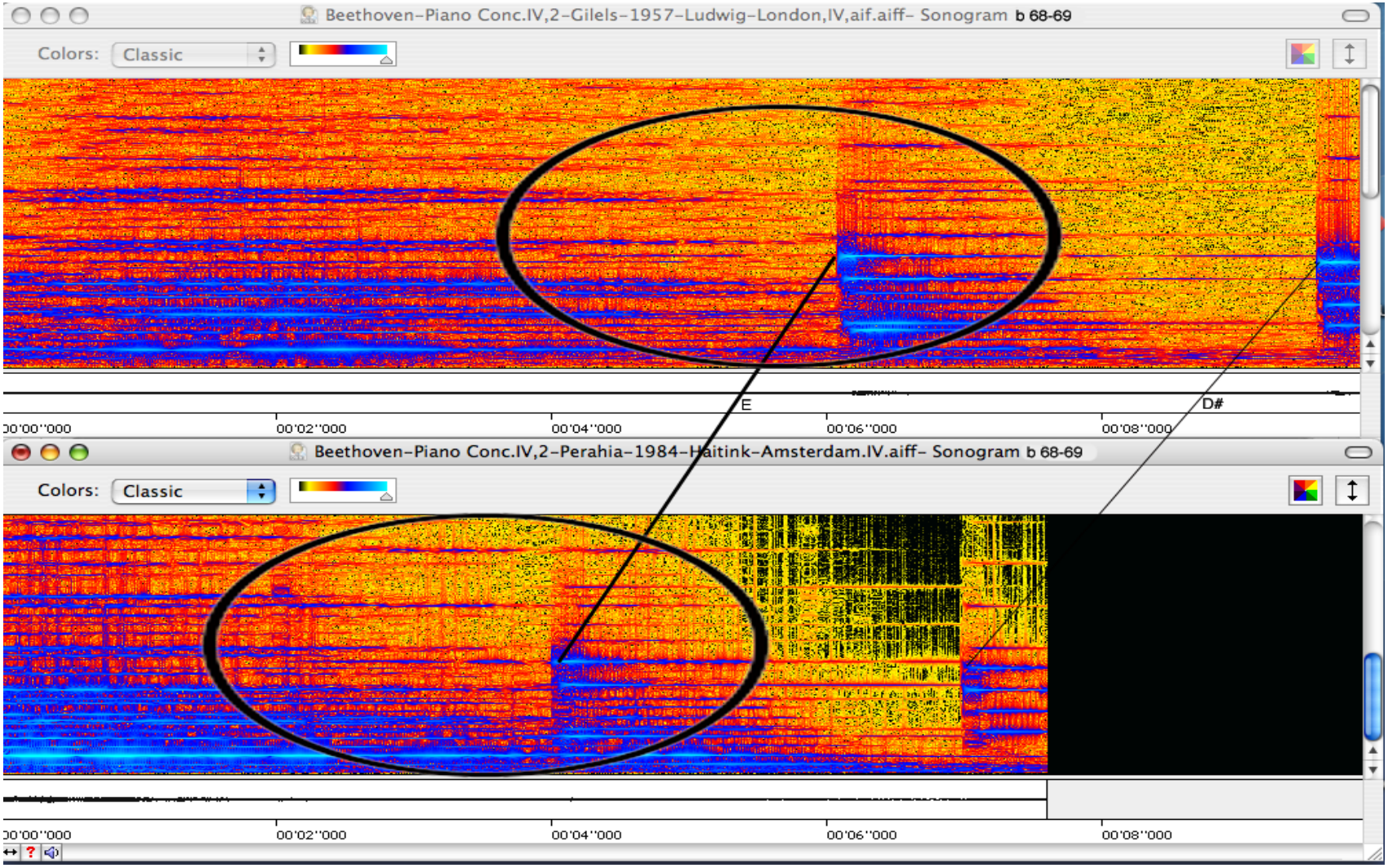
Graph 19 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 68-69, performances by: Gilels, Kissin.



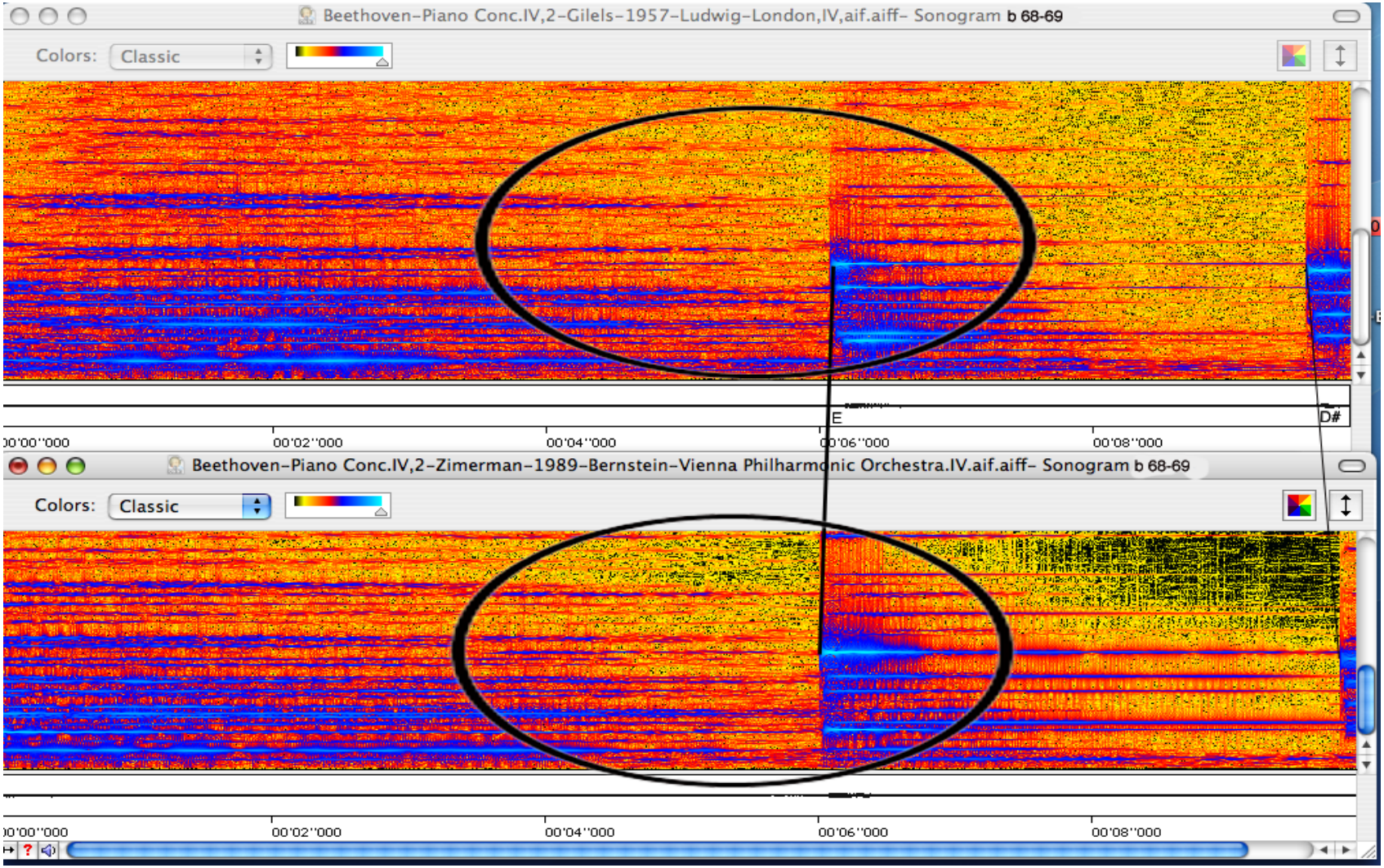
Graph 20 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 68-69, performances by: Gilels, Kuerti.



Graph 21 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 68-69, performances by: Gilels, Lang-Lang.



Graph 22 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 68-69, performances by: Gilels, Perahia.

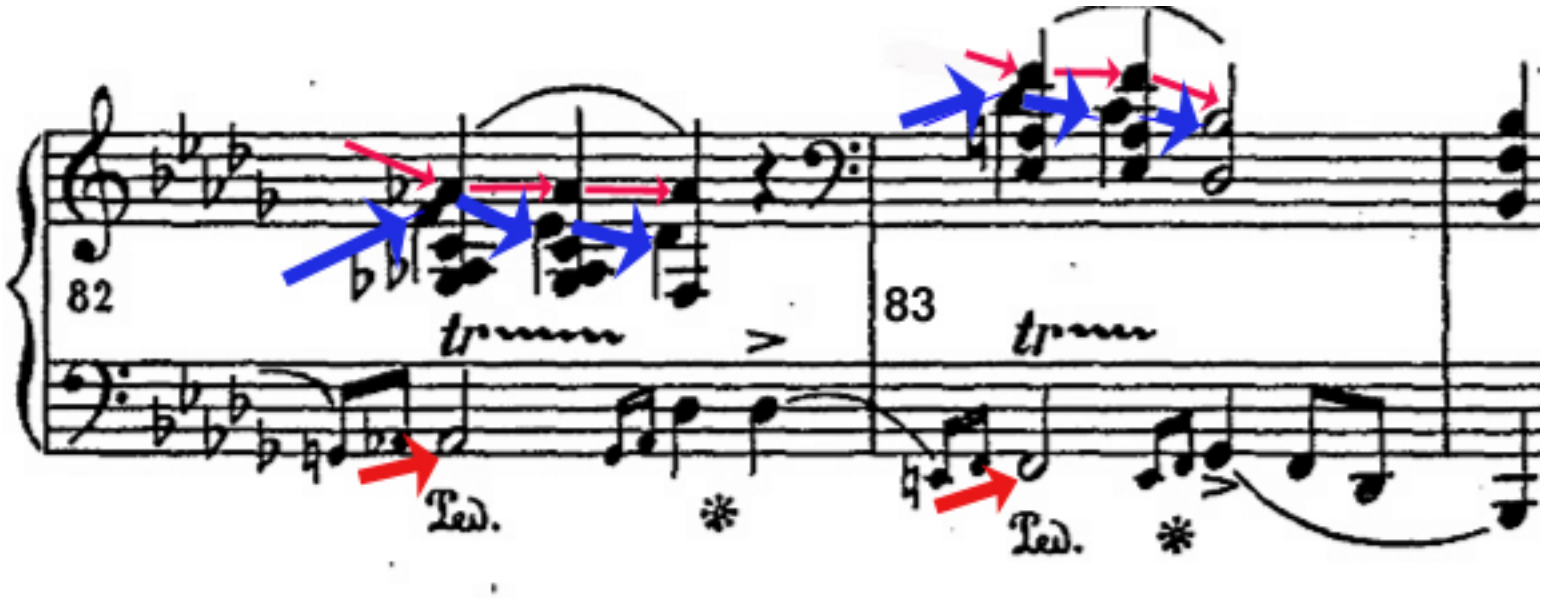


Graph 23 **Spectrograph**: Beethoven Piano Concerto No.4. II Movement, Measure 68-69, performances by: Gilels, Zimerman.

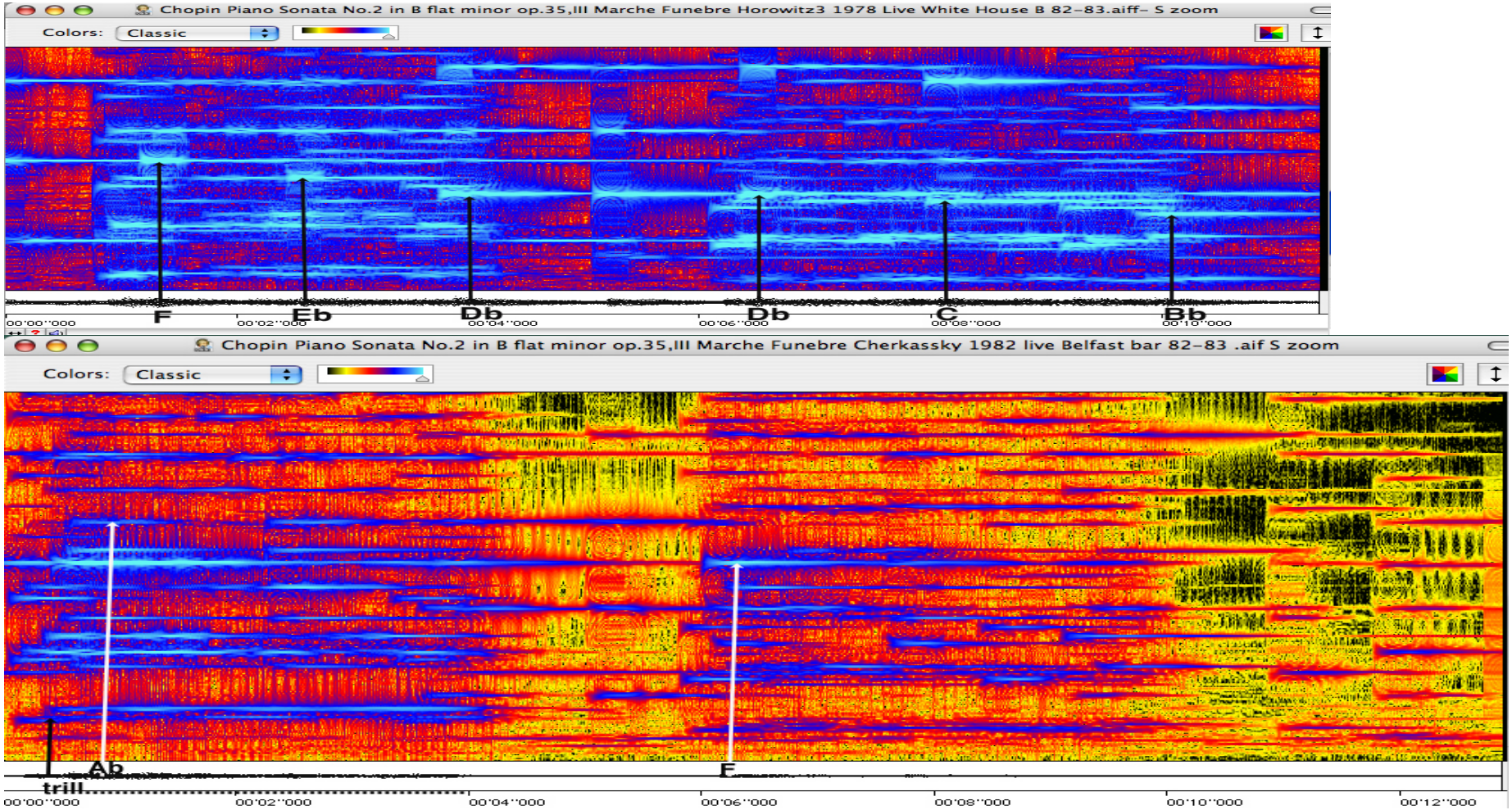
APPENDIX B

Additional amplitude timelines and spectrograms for

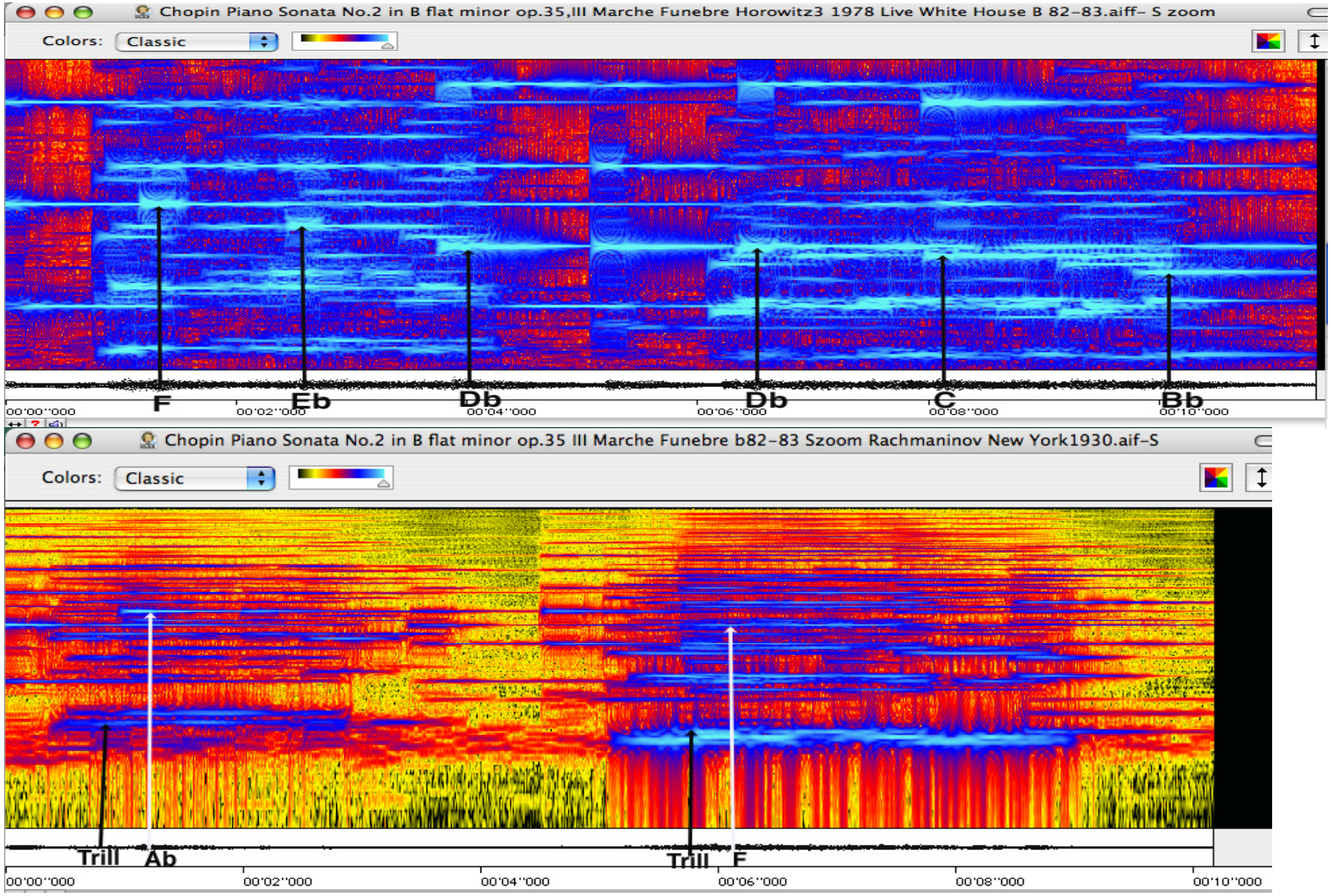
performances of Chopin Marche Funèbre



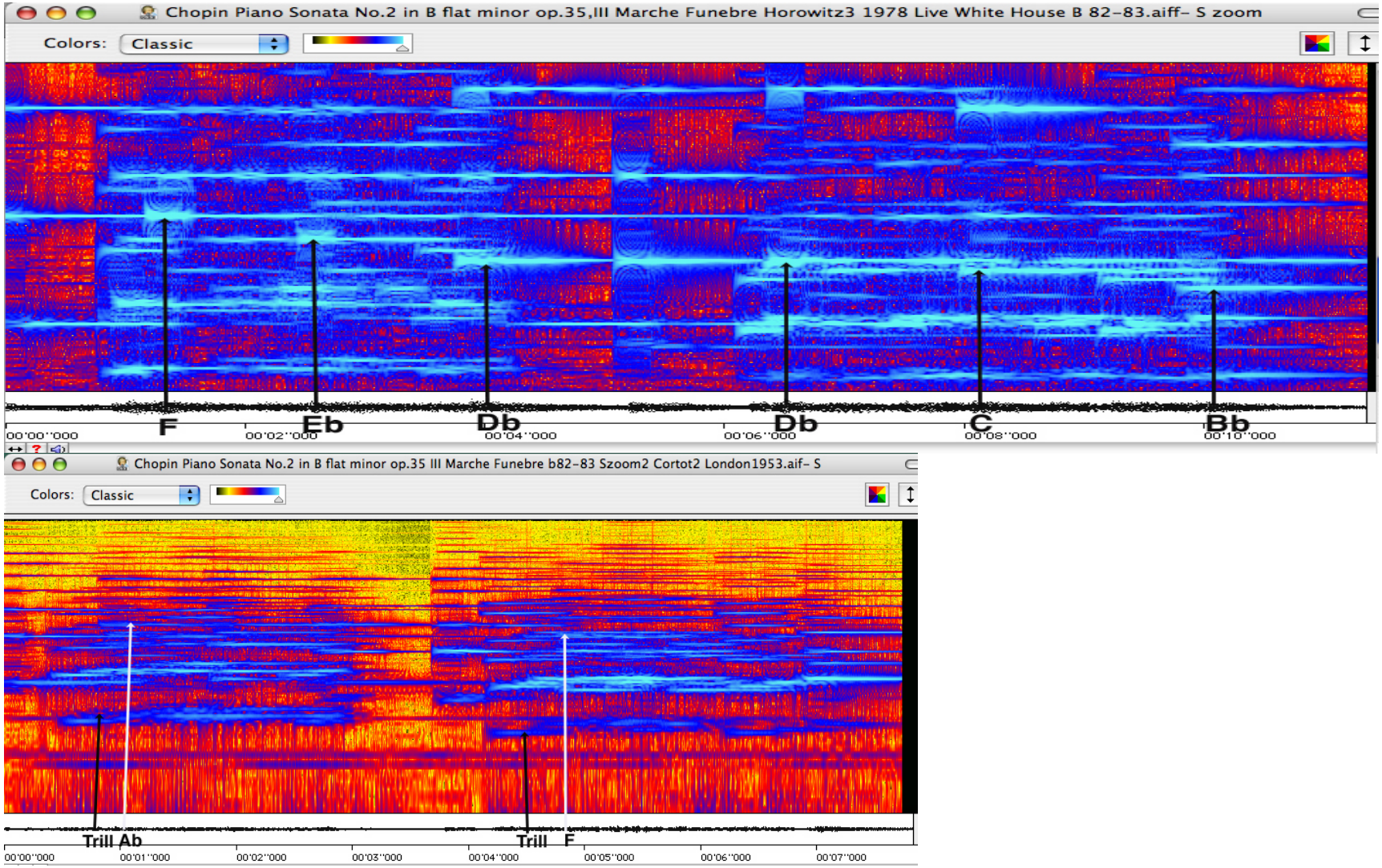
Score: Fryderyk Chopin, *Marche Funébre.* Measure 82-83.**Blue markers** -inner voice emphasis (Horowitz). **Red markers** - upper voice and trill emphasis of other performers).



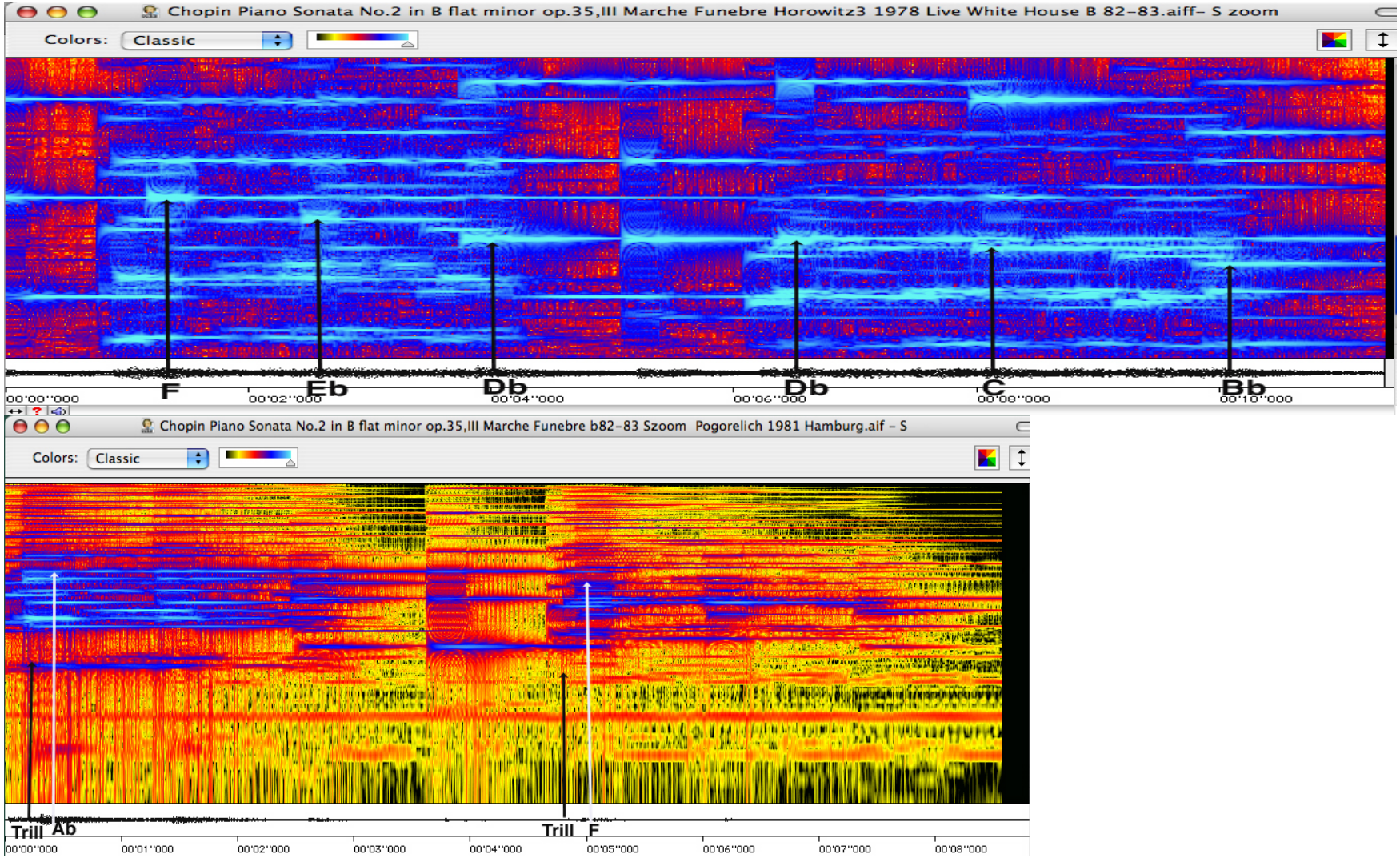
Legend: Spectrogram - Fryderyk Chopin, *Marche Funébre* Measure 82-83. **Horowitz's** performance: (top half**) black markers:** inner voice entrances emphasis and harmonic relationships. **Other Pianists** (bottom half) **White markers:** upper voice entrances, emphasis and harmonic relationships. **Black marker:** trill entrance and emphasis in the bass voice.



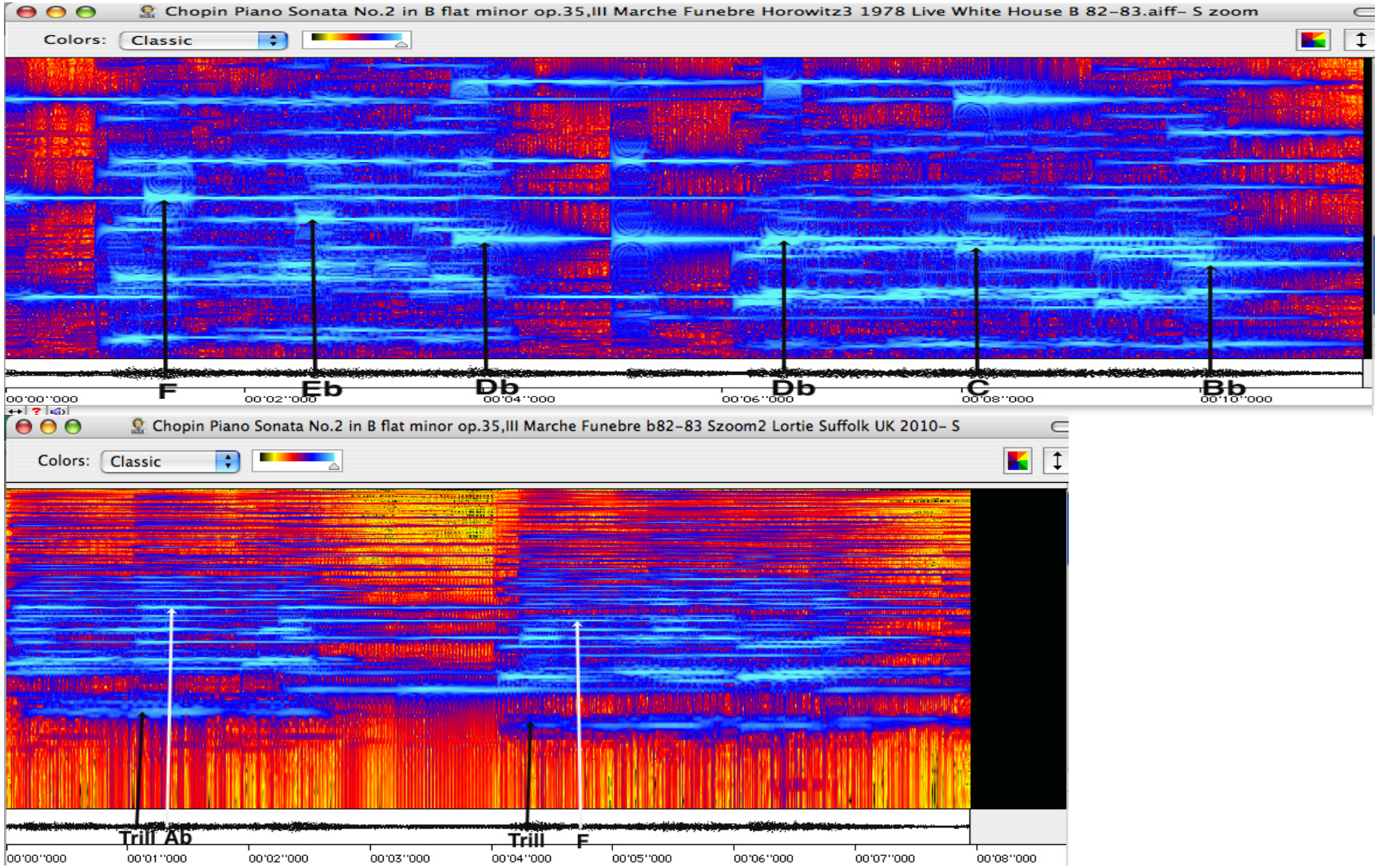
Spectrogram: Fryderyk Chopin, *Marche Funébre* Measure 82-83. (time aligned) Horowtz and Rachmaninov



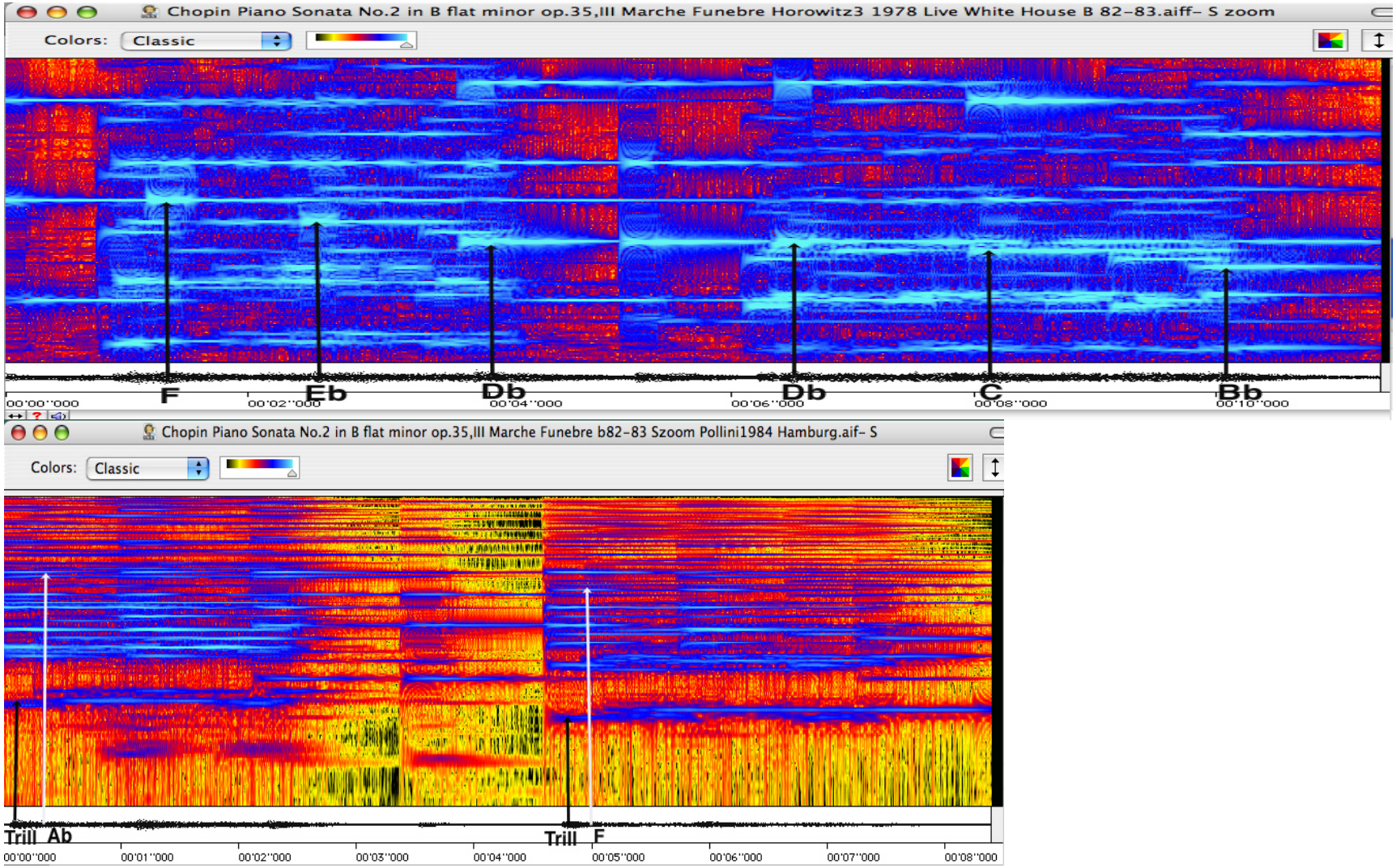
Spectrogram: Fryderyk Chopin, *Marche Funébre* Measure 82-83 (time aligned). Horowitz and Cortot



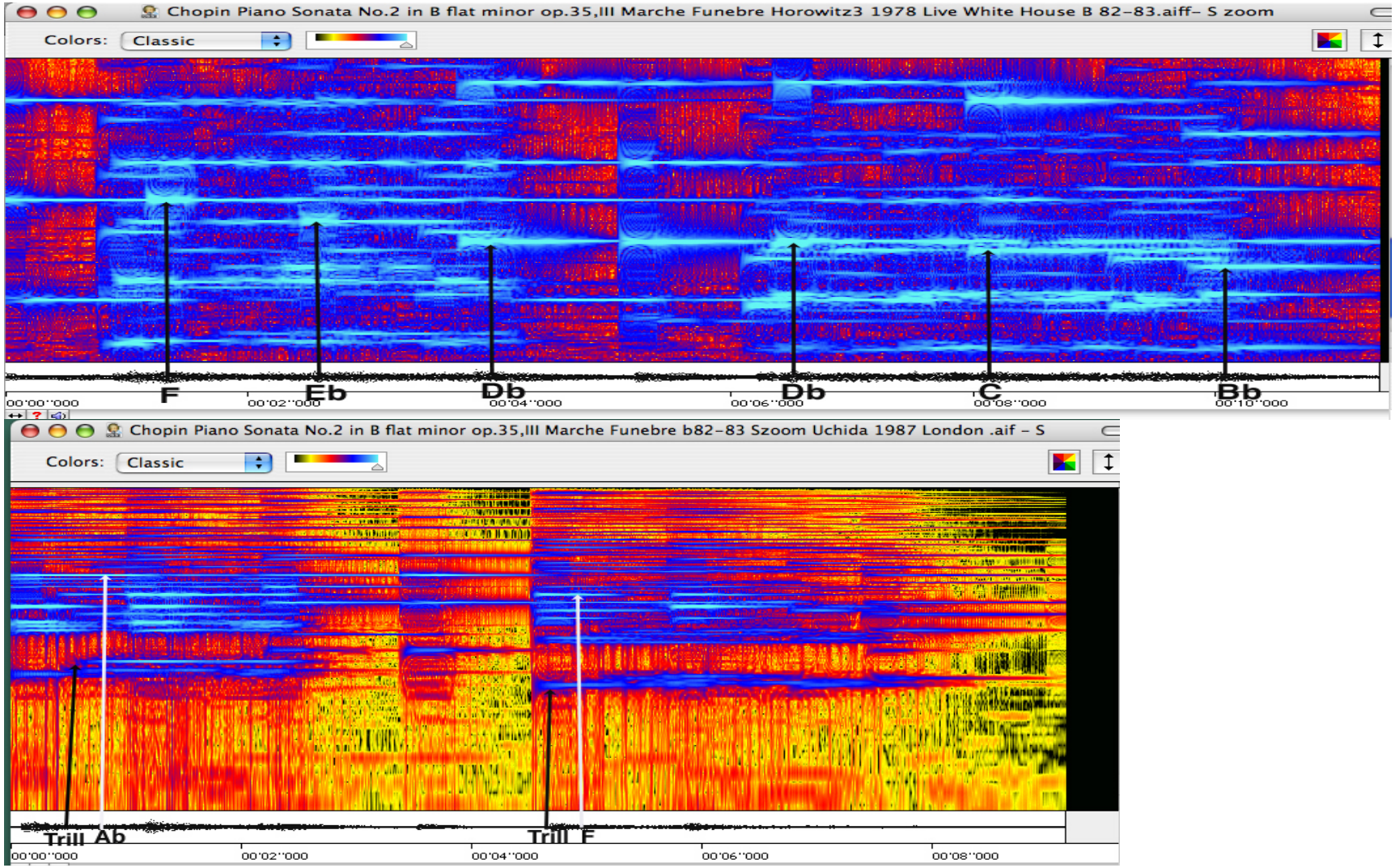
Spectrogram: Fryderyk Chopin, *Marche Funébre* Measure 82-83 (time aligned). Horowitz and Pogorelich



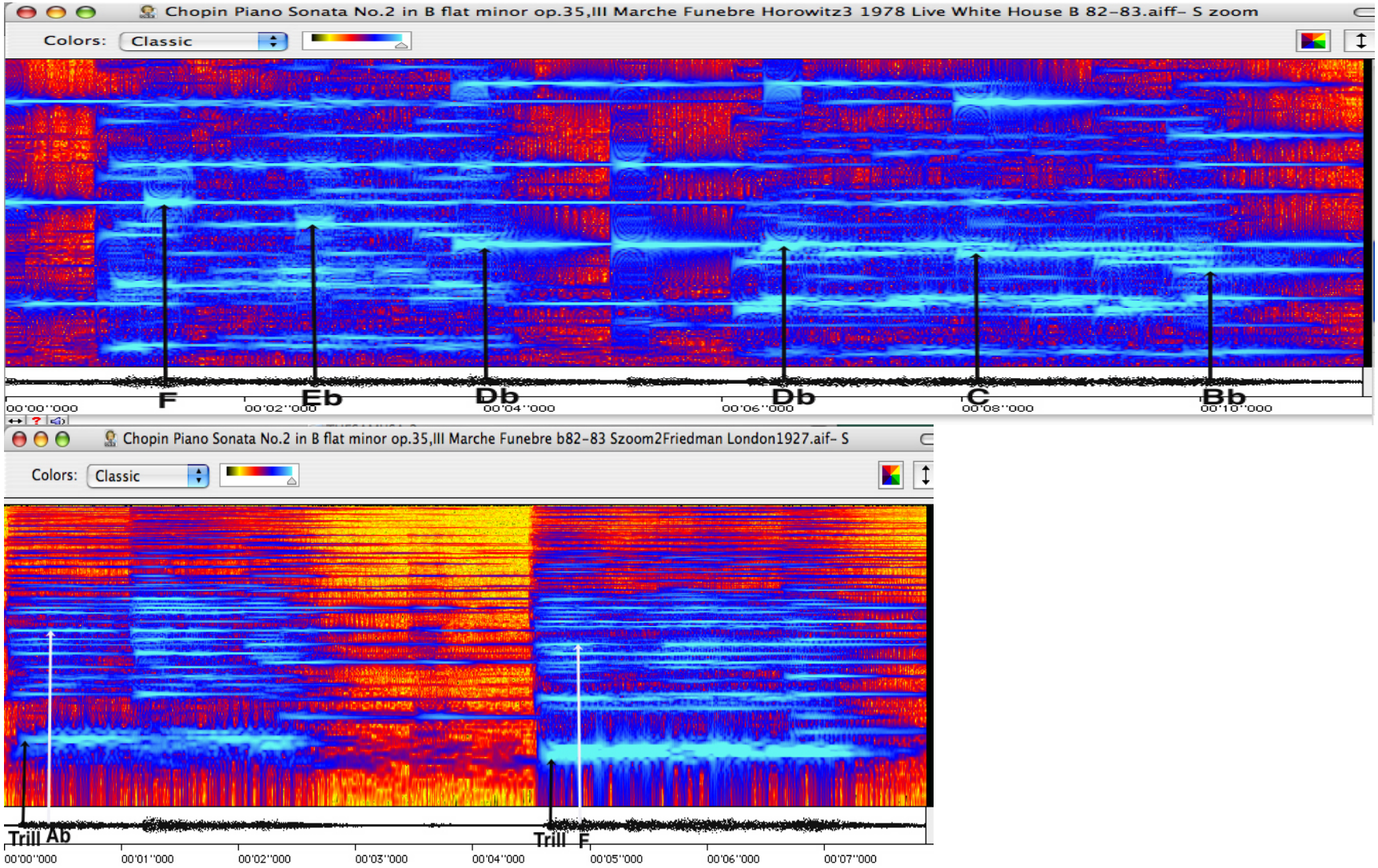
Spectrogram: Fryderyk Chopin, *Marche Funébre* Measure 82-83 (time aligned). Horowitz and Lortie



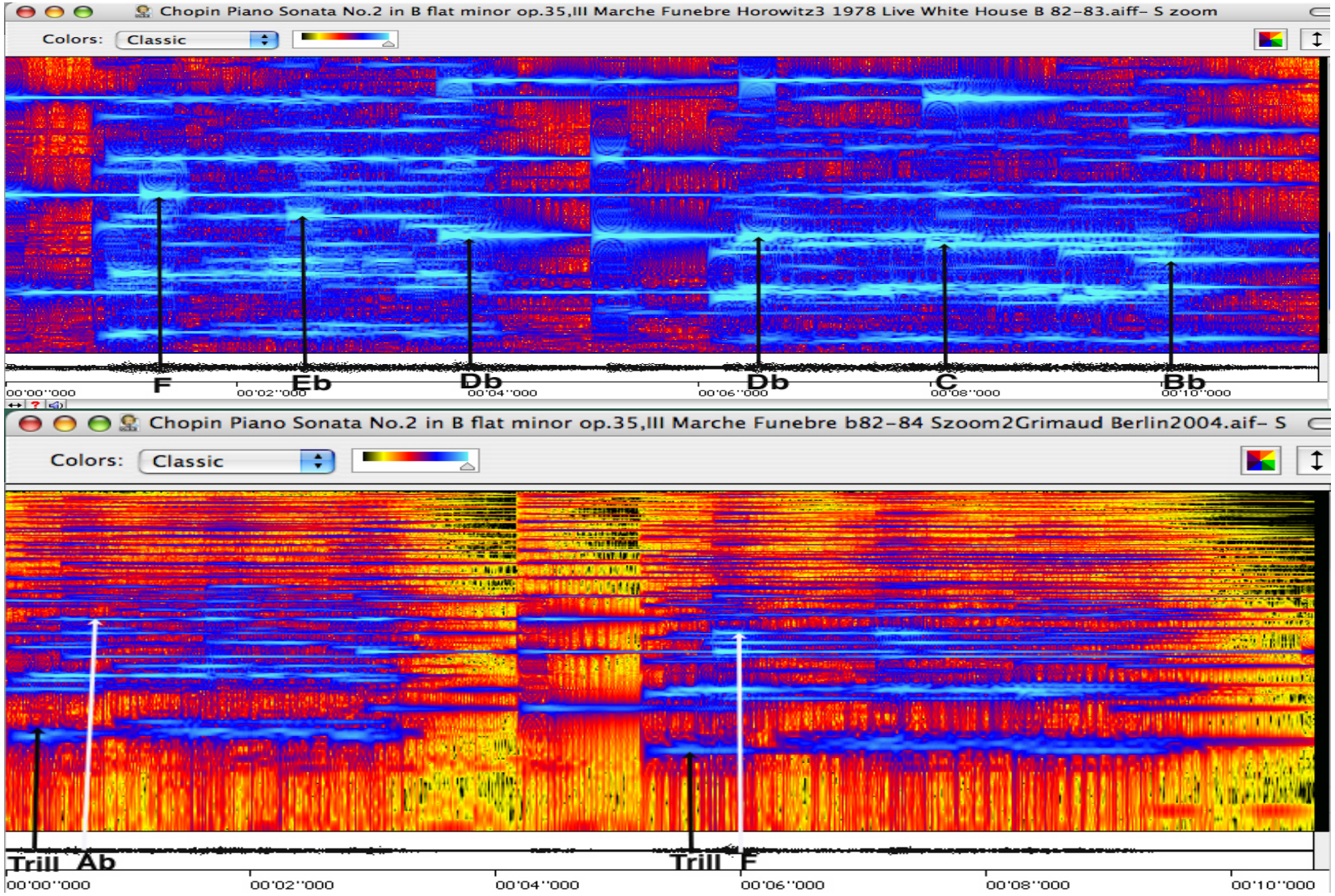
Spectrogram: Fryderyk Chopin, *Marche Funébre* Measure 82-83 (time aligned). Horowitz and Pollini



Spectrogram: Fryderyk Chopin, *Marche Funébre* Measure 82-83 (time aligned). Horowitz and Uchida.



Spectrogram: Fryderyk Chopin, *Marche Funébre* Measure 82-83 (time aligned). Horowitz and Friedman



Spectrogram: Fryderyk Chopin, *Marche Funébre* Measure 82-83 (time aligned). Horowitz and. Grimaud