Michael Davis
Prof. Bard-Schwarz
26 June 2018
MUTH 5370

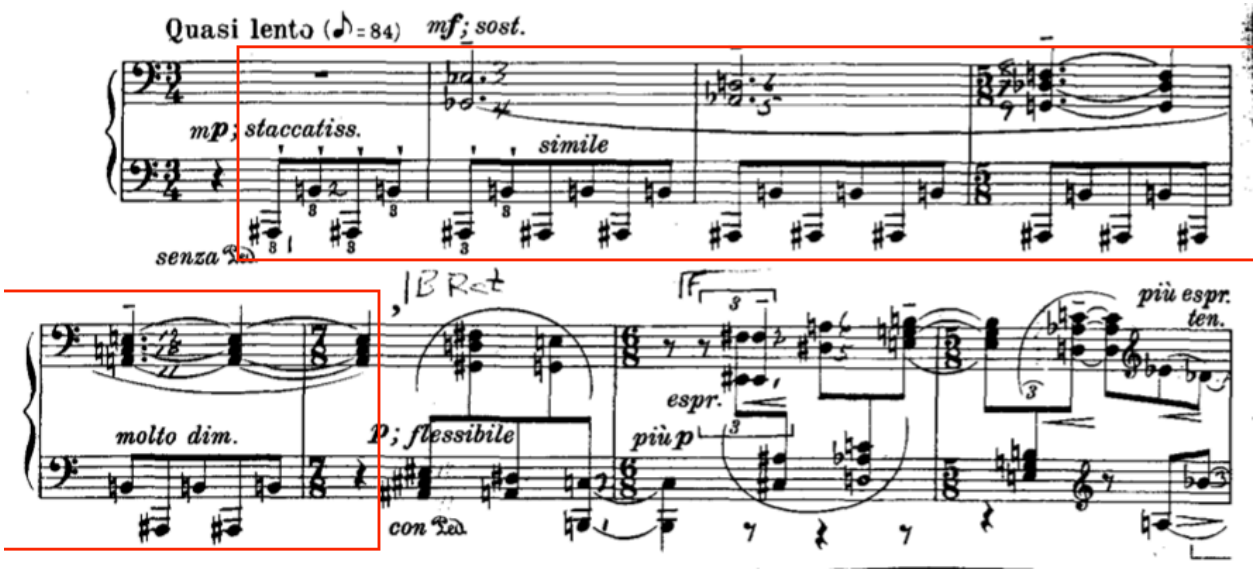
Tonal Polarity: Tonal Harmonies in Twelve-Tone Music

Luigi Dallapiccola's *Quaderno Musicale Di Annalibera, no. 1 – Simbolo* is a twelve-tone composition that I find full of fascinating musical moments. The overall form of the movement splits it into three distinct sections similar to a ternary ABA' form, but without the harmonic expectations that would actually make it so. The A section is from measure 1 to measure 16. Dallapiccola introduces the first row and several important transformations here. The B section begins in measure 17 at the tempo change and contains new ideas and greater diversions from the initial row, much like the B section of a classical common practice composition would contain new ideas and modulate to a new key area. The A' section begins in measure 37 where the tempo returns to what it was at the beginning and same eighth note pattern returns to the left hand. It is an abbreviated restatement of the A section. Throughout the surface of Dallapiccola's *Quaderno no. 1* I hear the polarity of tonal references. These tonal references serve not as functional tonal harmony, but as connections (usually by interval class 1) between each harmony in the row and sometimes between row forms. Each row form usually alternates ascending and descending ic1 lines.

The opening row in the A section begins on the A# and B eighth notes in the left hand. This A# - B dyad continues as an ostinato through the first five measures – the full length of the row. The row continues in the blocked chords in the right hand. The row is P10, <TE3682157094>, mapped out with "twelve counted" order numbers in example 1.[1] I have a difficult time hearing the row here, however. The tonal references are what I hear much more

[1]Joseph N. Straus, *Introduction to Post-Tonal Theory,* 3rd ed., (Upper Saddle River, NJ:

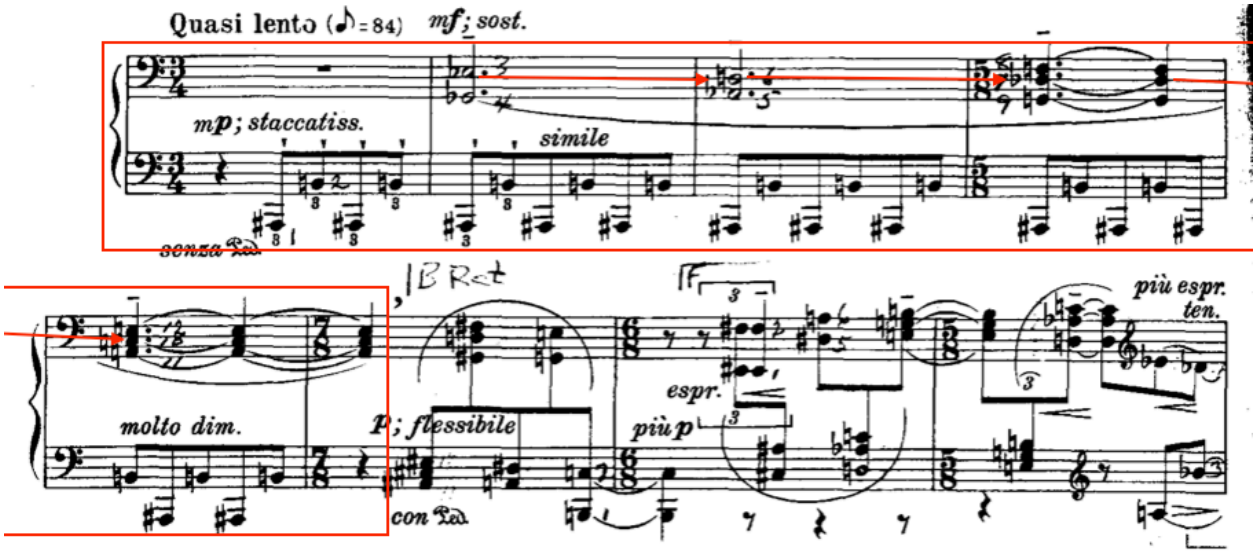
strongly in the opening five measures. In measure 2, the Gb-Eb dyad combine with the A# in the bass to sound like an Eb minor triad in second inversion. The A# in this instance would be enharmonically respelled as Bb. A# is metrically stronger than the B in the left hand making it sound much more prominent. I find that although the A#-Gb-Eb trichord sounds far more prominent than the B-Gb-Eb trichord, it does not sound too startlingly different. [36T] and [E36] share a prime form, (037), because they are related at T_9I.



Example 1: mm. 1-8, P10 with order numbers.

The tonal references continue. In measure 3 the Ab-D dyad in the right hand combines with the A# in the left hand due to its prominence metrically. Respelling the A# as Bb would form a Bb dominant seventh chord with a missing fifth. This trend continues in measure 4. The trichord in the right hand sounds like a G half-diminished seventh chord with a missing third. That third can be found in the left hand by respelling the A# as Bb once again. The last three notes of the row end with A-C-E, which is a minor triad. In set theory it is [904], which is

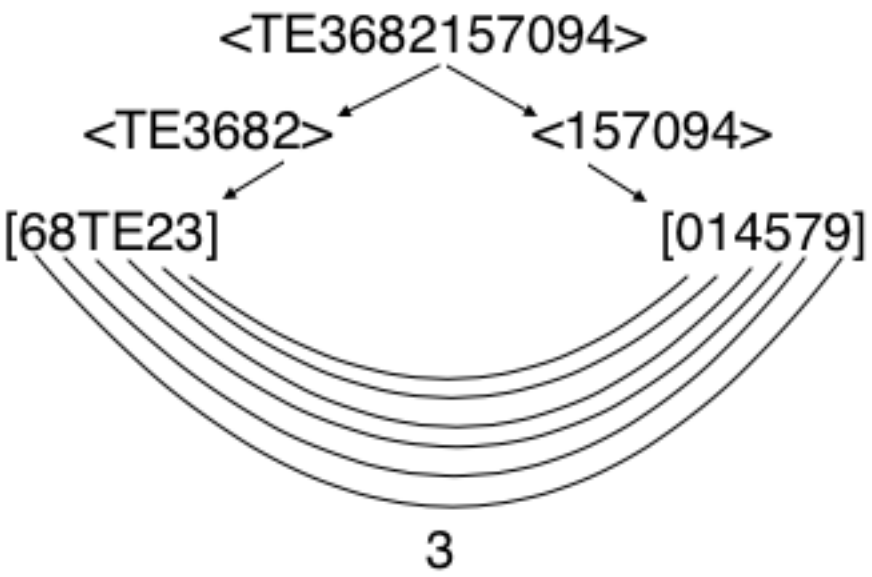
another (037) trichord related to the second measure by T_6. This of course is not a functional tonal progression. Nevertheless, I hear these harmonies more than the row itself. The way I hear these harmonies "progress" through the music is through half step relationships, or by interval class 1. In the first row, there is a constant downward ic1 motion through measures 2-5. Example 2 shows this relationship. The Eb in the right hand in measure 2 moves to the D natural in measure 3, which moves to the Db in measure four, which finally moves to the C natural in measure 5. This connection, which recurs throughout the piece, is what I find actually makes all of the tonal sonorities meaningful and sound like there is a purpose to identifying them all.



Example 2: mm. 1-8, descending ic1 relationship in P10.

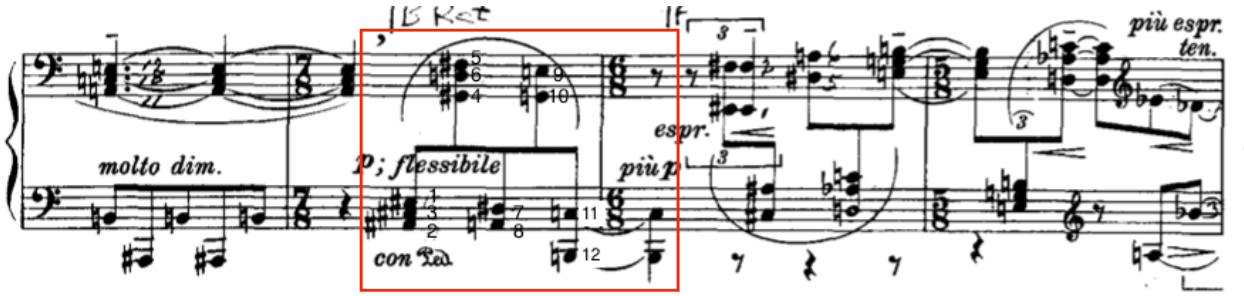
The relationships in the row the entire work is based upon allow for these harmonies to exist throughout the piece. The two hexachords that make up the first and second half of the row P10 are <TE3682> and <157094>. These two hexachords are related by T_3I (shown in example 3). The normal form of <TE3682> is [68TE23] which becomes prime form (014579). The normal form of <157094> is [014579], which of course is prime form (014579). Relationships

found in the beginning can be found at the end as well. I find that interesting, but more relevant to the polarity of the piece is breaking the hexachords into trichords to see what harmonic trends will be possible and is far more interesting to me. Example 4 displays these operations. There are numerous variations that can occur by grouping the notes differently, but I will focus on the simplest breakdowns of the row because, fortunately, those are what create the most common sonorities that appear in this piece. The first trichord is <TE3>. This is already in normal form for us, [TE3], which is prime form (015). In the normal form given to us it sounds like a major seventh chord with a missing fifth. The prime form shows us that it can invert to a major seventh chord with a missing third. Both occur frequently throughout the movement. The next trichord is <682>. This needs reordered to normal form, [268], from which we can find the prime form (026). In the normal form given by the row it sounds like a half-diminished seventh chord with a missing 3rd. That harmony occurs in many places throughout the movement, as you will see. The prime form shows us that it can also be inverted to a dominant seventh chord with a missing fifth. The third trichord is <157>, which is already in normal form for us. You can likely see that the prime form is (026) – the same as the previous trichord. This is why, as you will see, there will so often be two half-diminished seventh chords or two dominant seventh chords consecutively in the middle of a row form. Finally, there is <094>, which is [904] in normal form. This is a minor triad. The prime form is (037), which tells us we can invert this to create a major triad. I find it so fascinating that Dallapiccola constructed his row this way. There are other possibilities, but Dallapiccola mostly sticks to this trichord formula.



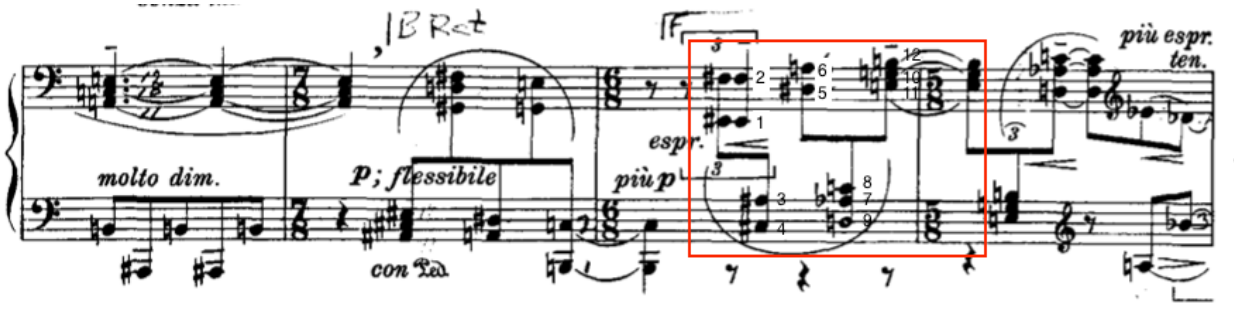
Example 3: Inversion relationship of P10

Example 4: Trichords



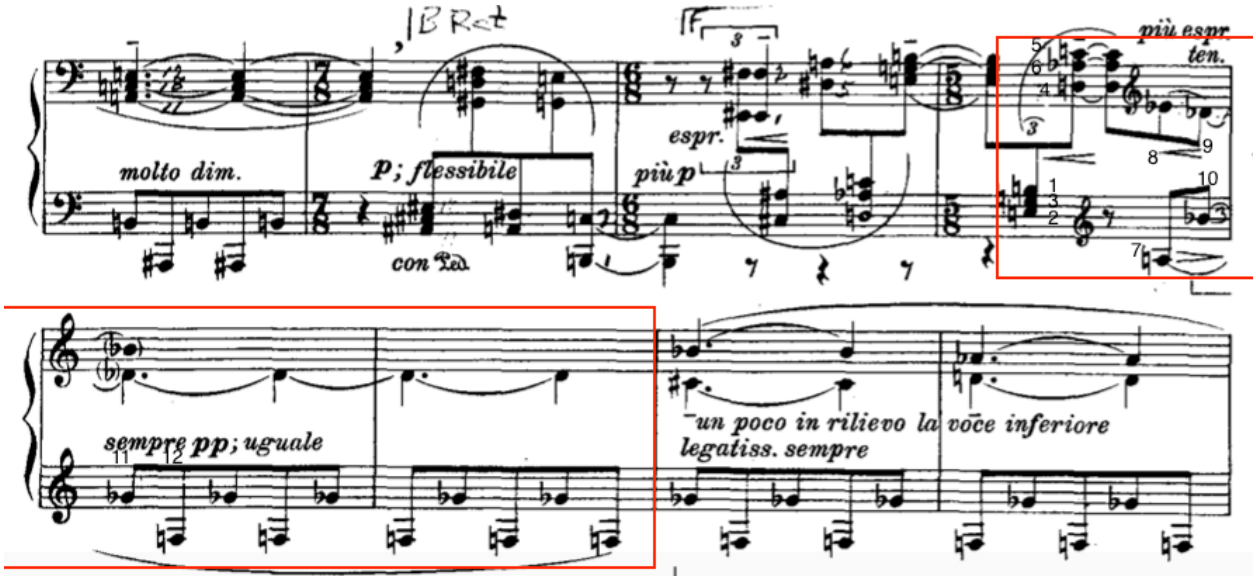
Example 5: mm. 5-8, R11 boxed with order numbers.

The next row form begins in measure 6. It is R11. Example 5 shows the row form with order numbers. This is the first row form backwards and transposed up a half step, or interval-class 1. That relationship restarts the downward ic1 found between harmonies in the previous row, now it is ascending. Only the sustained [904] (A minor) trichord, (037), is sounding at the beginning of measure 6. The next sound, which begins the new row, is [T15] – an A# minor chord, which is another (037). While I cannot hear the rows distinctly yet – this half step relationship is obvious.



Example 6: mm. 5-8, P5 boxed with order numbers.

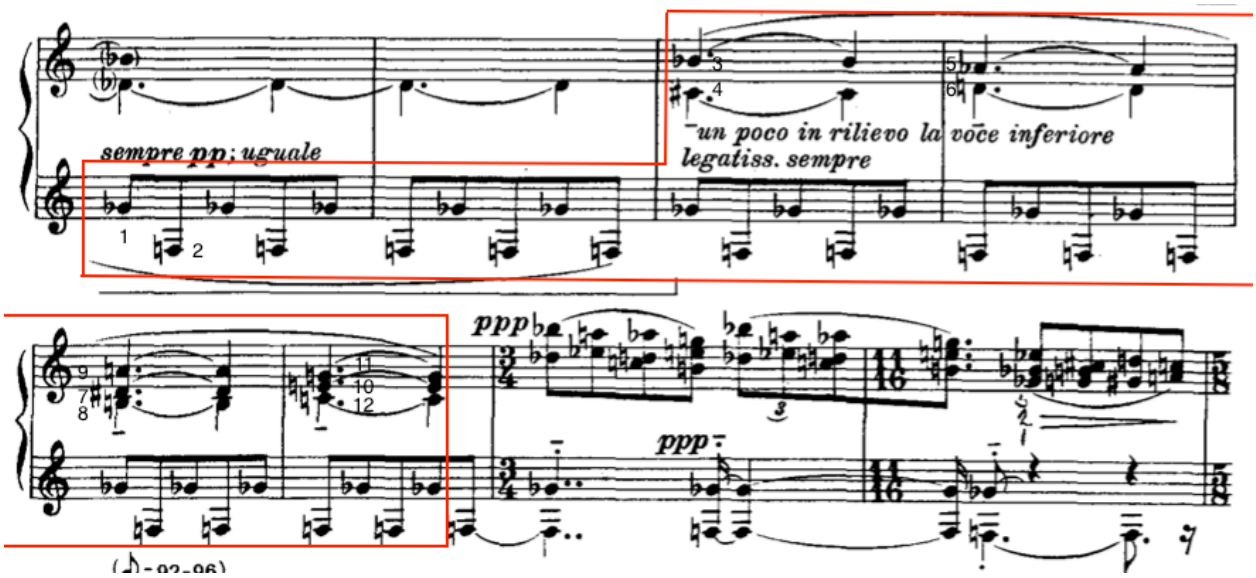
The next row form is P5 <56T13980274E> in measure 7 (shown in example 6). There is continuity between the previous row form and this one, but it caught me off guard the first time I heard it. Something new happens here. Instead of restarting the direction of ic1 motion, it begins and ends on the same pitch classes as the previous row, R11. It begins on 5 and ends on 11. The pitches occupy significantly different registers. P5 ends with <902> and <74E>, both of which create tonal sounding harmonies. <802> is a [802] trichord, prime form (026), which sounds like a D half-diminished seventh chord in close root position with a missing third. <74E> is [47E], another transposition of (037), which sounds like an E minor triad in root position.



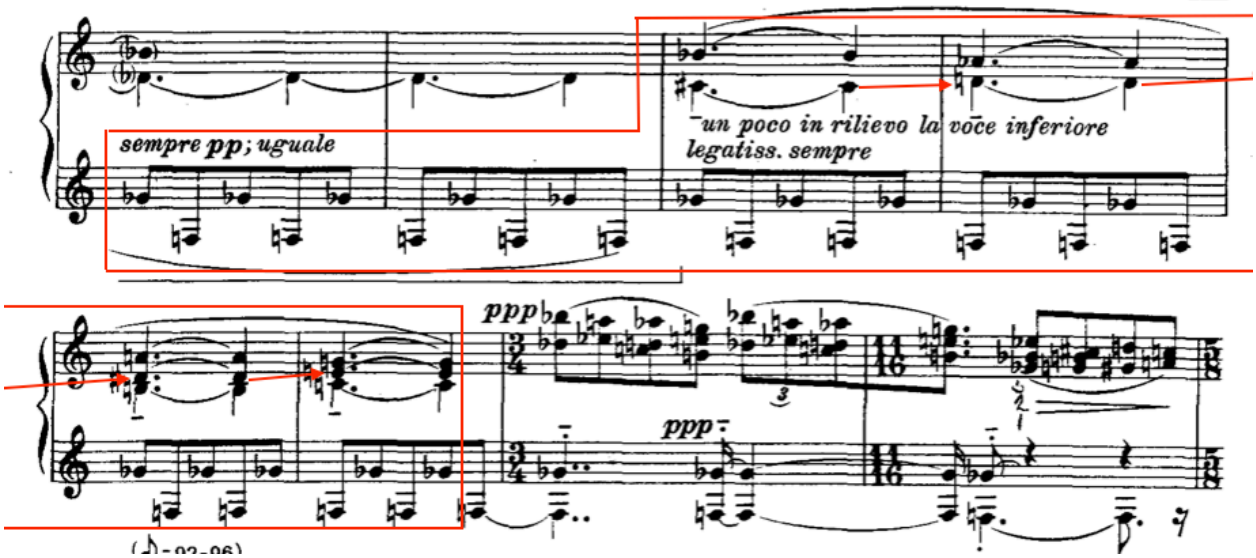
Example 7: mm. 5-12, R5 boxed with order numbers.

The next row, R5 <E47208931T65> (shown in example 7), begins in measure 8 and concludes in measure 9. It is the previous row, P5, in reverse. As such it sounds incredibly similar to me and introduces a new way that Dallapiccola mirrors motion in the piece. It begins on the same exact pitches, not just pitch classes. The first six pitches are recreated exactly –

which also exactly recreates the E minor triad and the D half-diminished seventh chord. This level of similarity creates a strong connection to my ear. (At this point I have removed the prime forms of harmonies because it will be redundant to continue.)

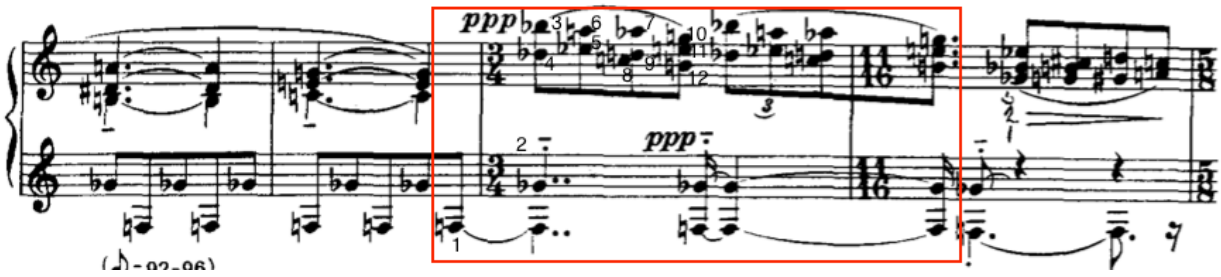


Example 8: mm. 9-16, I6 boxed with order numbers.



Example 9: mm. 9-16, ascending ic1 relationship in I6.

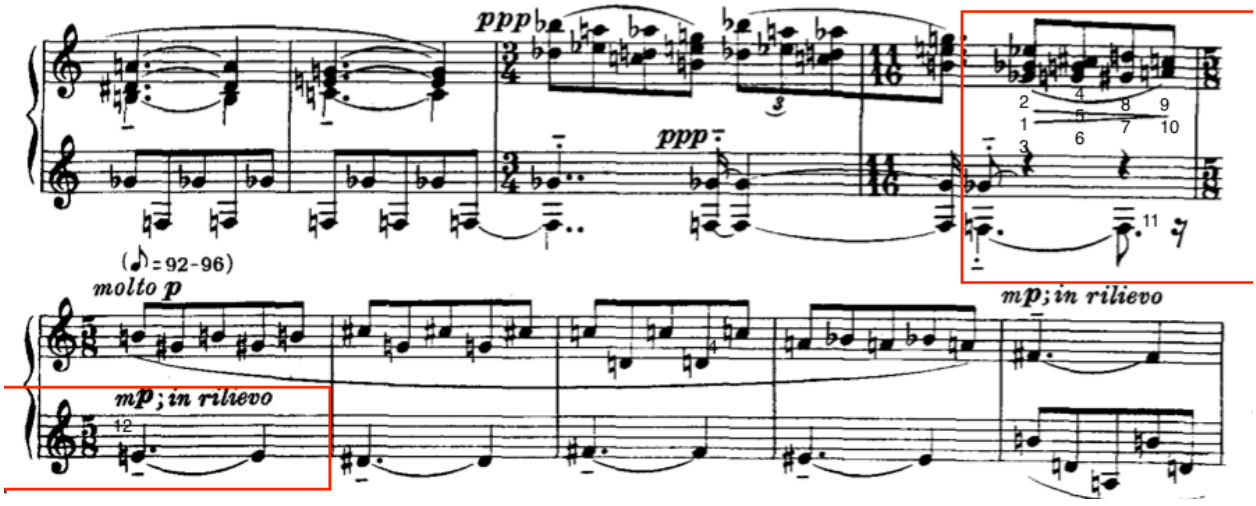
A register shift at the end of measure 8 anticipates a return to the same type of ostinato in the left hand in measure 9 as there is at the beginning. Following a measure of sustain and repetition the first row transformed by inversion is found in measures 11-14, I6 <651T823E9470> (shown in example 8). I still hear a very strong connection to the row that precedes it. The first two order numbers are on the Gb and F in the left hand in measure nine which is shared by the last two order numbers of R5. This obscures the division of the row forms.[2] Order numbers 3 and 4 are found in the right hand in measure 11 – the Bb and C#. Order numbers 9 and 10 of R5 are Db and Bb respectively. Tonal references continue here as well and are still what I hear dominating the surface of the music. Measure 11 is a Bb minor triad. Measure 12 is a D diminished triad. Measure 13 is a B dominant seventh chord. The F in the left hand is the fifth. It is harder to hear that in this measure because the Gb is metrically more prominent. Measure 14 is a C major triad in close root position; the left hand is not part of the harmony. Once again, interval-class 1 connects these harmonies (shown in Example 9).



Example 10: mm. 13-16, R5 boxed with order numbers.

[2]Ibid., 190-191.

Measure 15 is P5 <56T1390274E> again (shown in example 10), which then repeats on beat three of the measure. The tonal references in this row form are interesting. I find the first two rather difficult to hear because the F-Gb dyad has switched to sustained notes rather than repeated eighth notes. The first tonal harmony starts with the Bb-Db dyad in the right hand. In multiple hearings of this passage and in performing it, I heard two different tonal harmonies occurring at once. Occasionally I heard F-Db-Bb forming a Bb minor triad. Other times I heard Gb-Db-Bb, forming a Gb major triad. The Gb major triad usually sounds stronger to me because the Gb sounds simultaneously with the Bb and Db while the F is tied over from the previous measure. As we already know from above, these are inversions of the same set class, (037). [T15] is (037) prime form. [6T1] is also (037) prime form. These two triads are related at $T_{11}I$ – similar to the ic1 relationship that connects all of the other harmonies in this row form, which is easy to see and hear in this row form. The top line in the right hand is Bb-A-Ab-G – all ic1 descending.

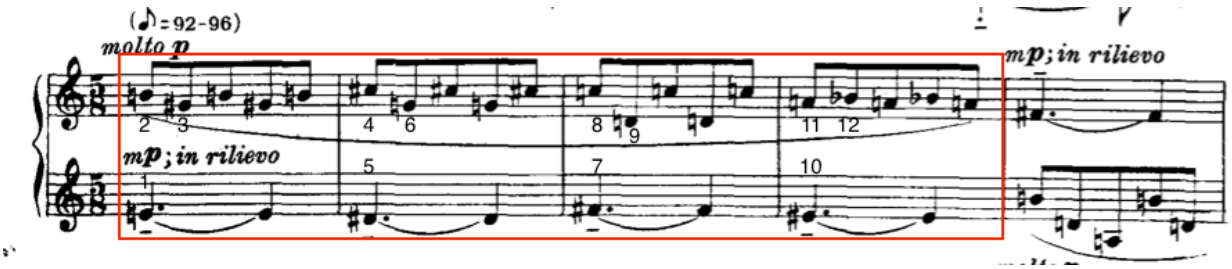


Example 11: mm. 13-21, R4 boxed with order numbers.

Measure 16 is the last row form before the B section begins. This row is more difficult for me to hear because it is formed rather creatively. It took me a long time before finally analyzing it as R4 <T361E7820954>. Example 11 shows how I identified this row. The first ten order numbers are found in the eighth note chords in the right hand. Order number eleven is the F natural in the left hand, which sustains until just after the ninth and tenth notes of the row have sounded. The row finishes on the E natural in the left hand in measure 17. The E serves double duty as the first order number in the new row form that marks the beginning of the B section helping to link the two sections. Once again, however, it is the tonal references in this row form that sound to the fore for me. The first tonal harmony is the first stack of eighth notes in this row, Gb-Bb-Eb, which sounds like an Eb minor triad in close position first inversion. The second harmony is on the next stack of eighth notes, G-B-C#, which sounds like a C# half-diminished seventh chord with a missing third in close position second inversion. The next harmony is on the third stack of eighth notes, G#-D, when combined with the F in the left hand sounds like a D diminished triad in first inversion. Lastly, the final harmony of the row form is on the last eighth note stack of the measure, A-C, when combined with the F in the left hand sounds like an F major triad in root position. Like the previous row form, the ic1 relationship is really easy to hear because it occurs in a single voice in the right hand. The Gb-G-G#-A ascending in the bottom voice of the right hand are all related by ic1.

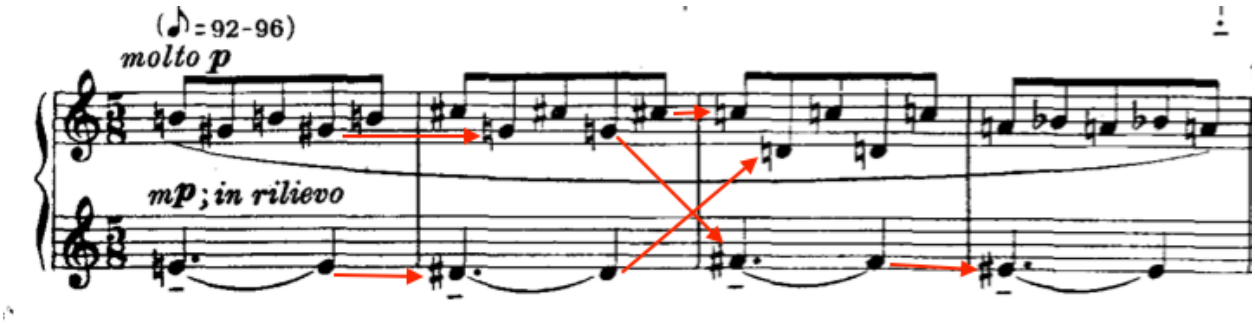
The texture changes significantly and is accompanied by a slightly faster tempo at measure 17, marking the beginning of the B section. The B section is the most active part of this movement. Eighth notes and sustained notes still comprise the texture, but they are very different for the first eight measures. The eighth notes start in the right hand and the interval sizes are significantly smaller than the repeated interval class 13 eighth notes found in the left hand at the

beginning of the movement. The sustained notes are different too – monads instead of dyads or trichords.



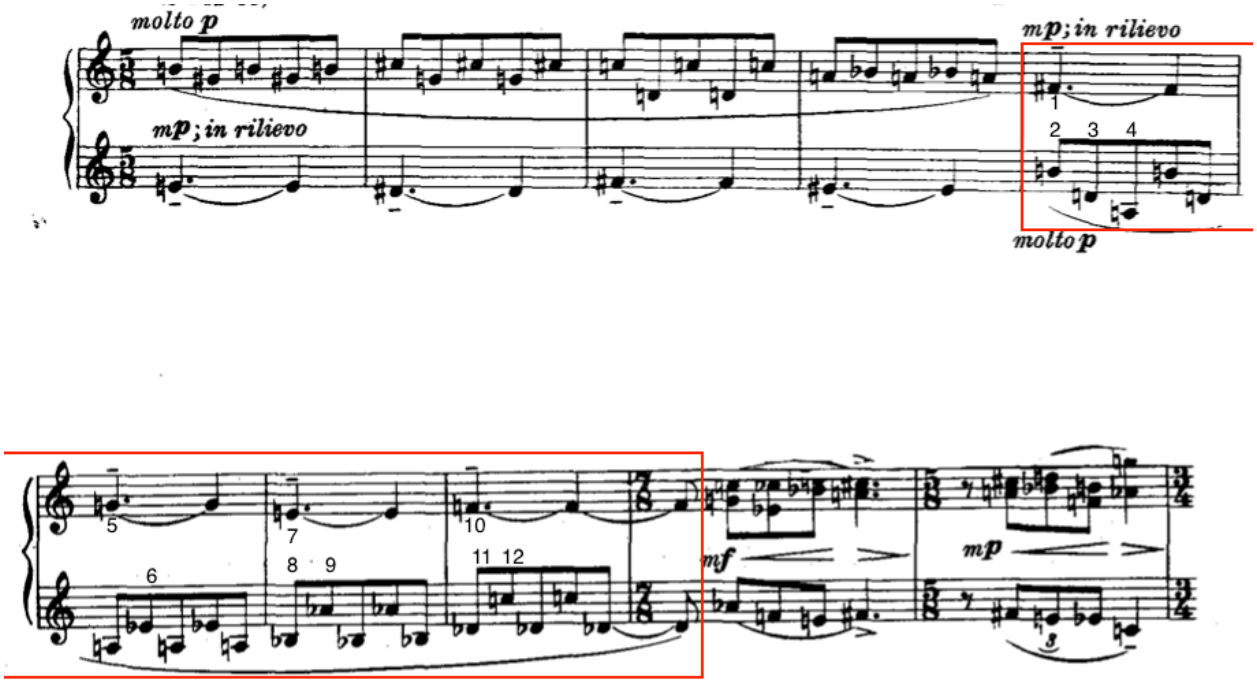
Example 12: mm. 17-21, RI10 boxed with order numbers.

The first row is RI10 <4E813760259T> (shown in example 12) in measures 17-20. It begins on the last note of the previous row transformation. Although linked well with this common tone, what I hear most prominently once again are the tonal references. Measure 17 is comprised of the pitches E, G#, and B – an E major triad stacked in closed root position. Measure 18 is comprised of the pitches D#, G, and C#. This forms a D# dominant seventh chord with a missing fifth, once again stacked in closed root position (this is made more obvious by enharmonically respelling the G as F double sharp). This trend continues in measure 19, which is comprised of the pitches F#, D, and C. These pitches form a D dominant seventh chord with a missing fifth, still stacked up in closed root position because the lowest pitch in the right hand, D, is actually below the F# in the left hand. The C even allows for the C# in the previous measure to properly "resolve" downward the way chord sevenths are supposed to in tonal music. I also hear measure 20 as a tonal harmony. E#, A, and Bb are the pitches in that measure. Respell E# as F and there is a Bb major seventh chord with a missing third.

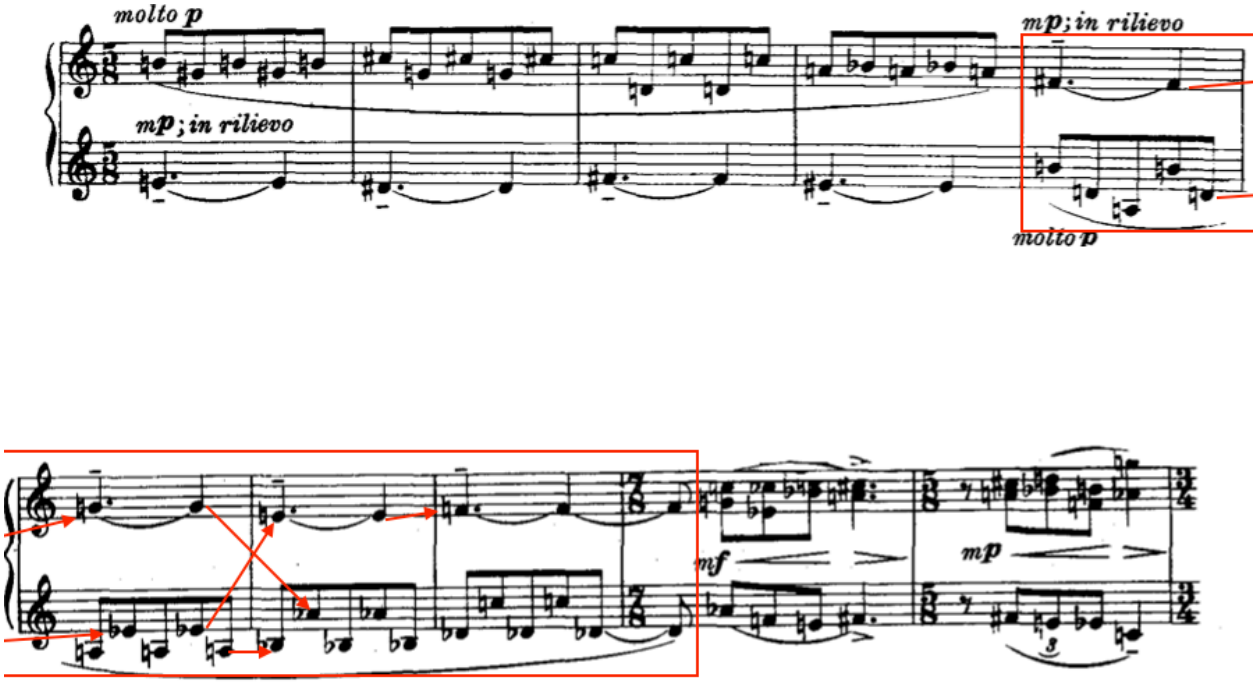


Example 13: mm. 17-20, descending ic 1 relationships in RI10.

Once again this of course is not a functional tonal progression, but it is the level of the music I most prominently hear and there is a connection between all of these chords. Example 13 shows how the chords are connected by ic1. This ic1 motion was more challenging to identify at first because it was so much more varied and complex than what had previously occurred. The E and the G# in measure 17 both move down to the D# and the G in measure 18. The E to D# is the most prominent movement. The G# to G is obscured by the rhythm. The B in measure 17 would move down to an A# in measure 18 if it had a fifth, but instead it moves up to the C# to create a seventh chord. The D# in the left hand in measure 18 moves down to the D in the right hand in measure 19. The G in the right hand in measure 18 moves down to the F# in the left hand in measure 19. The C# at the top of measure 18 moves down to the C at the top of measure 19. This is the most prominent motion downward. The other two moves are obscured by the rhythm. The connection from measure 19 to 20 is weaker – only the F# moving down to the E# is connected by a half step.

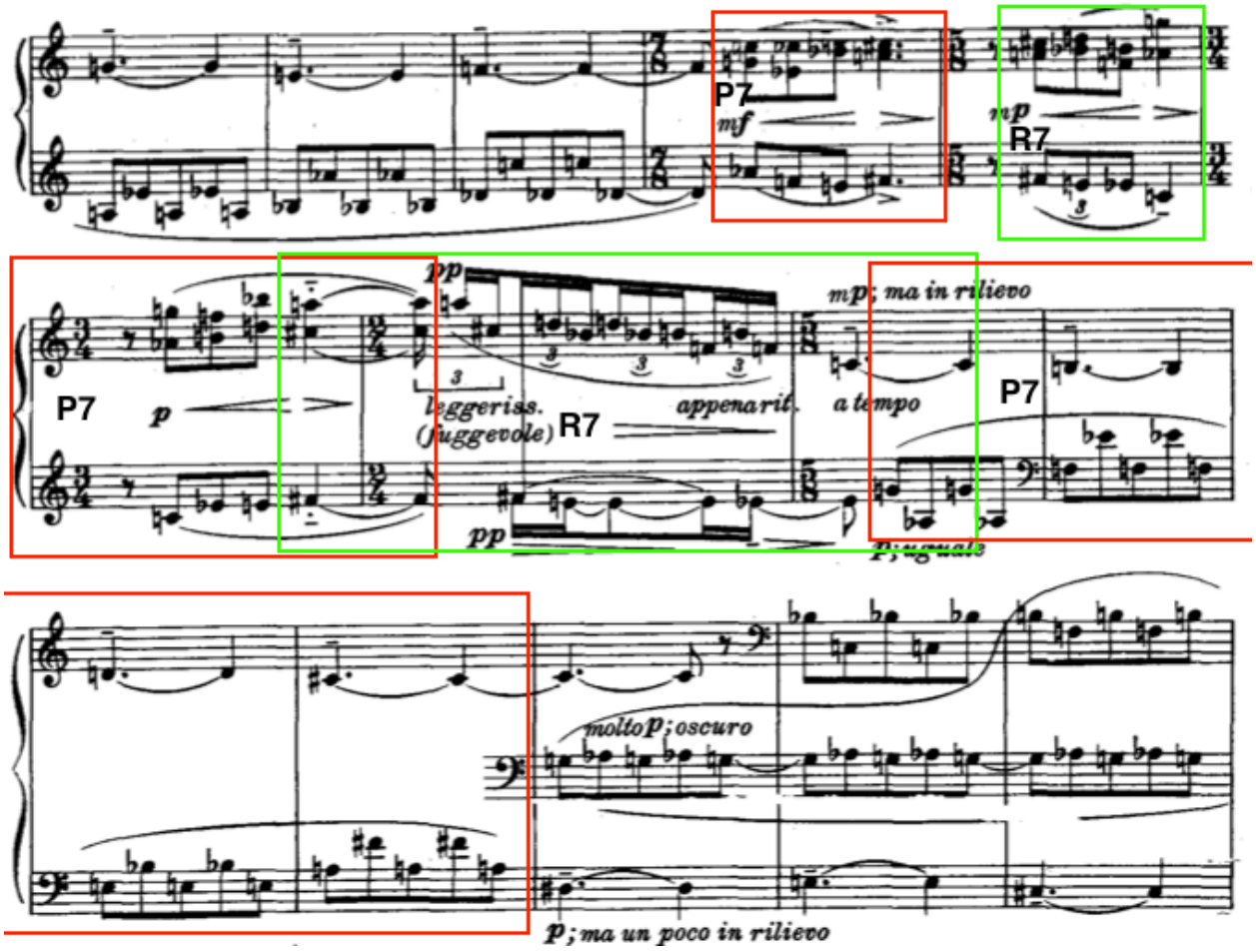


Example 14: mm. 17-26, R0 boxed with order numbers.



Example 15: mm. 17-26, ascending ic1 relationships in R0.

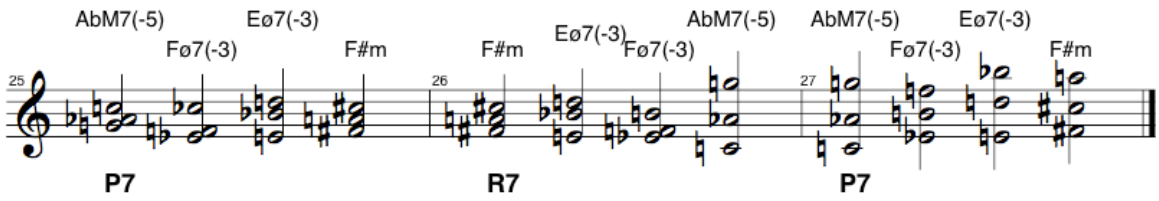
The next row begins in measure 21 and continues through to the tied eighth notes at the beginning of measure 25. It is R0 <6E29734T8510> (shown in Example 14), but I still struggle to hear the row. Instead, I hear the continuation of tonal references. The hands reverse – the eighth notes move to the left hand and the sustained pitches move to the right hand, however it stays in the same register. Measure 21 notably deviates from the dyad pattern and has three different pitches. These pitches collected, plus the right hand note, are A, D, F#, and B. This creates a complete B minor seventh chord in third inversion in open position, but it is still relatively close together so it is easy to hear. It is still connected by interval-class 1 to the measure before it – this time going up which continues the alternating ascending/descending pattern. The E# in the left hand in measure 20 moves up to the F# in the right hand in measure 21 – this is the most prominent movement. The Bb in the right hand in measure 20 also moves up to the B natural in the left hand in measure 21, but this is obscured by the rhythm. This pattern continues to the end of the row (shown in example 15). Measure 22 contains A, Eb, and G. This creates an A half-diminished seventh chord with a missing third in closed root position. The F# and the D in measure 21 move up by half step to the G and Eb in measure 22. The F# to G is the most prominent because the D to Eb is obscured by the rhythm. The pitches in measure 23 are Bb, E, and Ab. This forms a Bb half-diminished seventh chord with a missing 3rd in close root position. All three pitches from measure 22 move up by a half step to the pitches in measure 23, but the A to Bb is the most prominent because the others are obscured by the rhythm. Measure 24 contains Db, F, and C – pitches that form a Db major seventh chord with a missing fifth in closed root position. The connection to this measure is weaker as only the E in measure 23 moves up to the F in measure 24.



Example 16: mm. 22-35, P7 (red) and R7 (green) alternations from mm. 25-32.

Measure 25-28 is what I hear as the climax of the movement. There is a new row form in each measure until measure 29, which is four measures long and relaxes the music after the active climactic section. These measures share a fascinating relationship that I find very obvious to the ear and set them apart from the rest of the movement – each row form is the retrograde of the previous. Example 16 shows these relationships. Measure 25 is marked mezzo-forte – the loudest point of the entire movement. The row form here is P7. The row form in measure 26 is R7. It begins on the same exact pitches after an eighth rest. Measure 27 returns to the prime

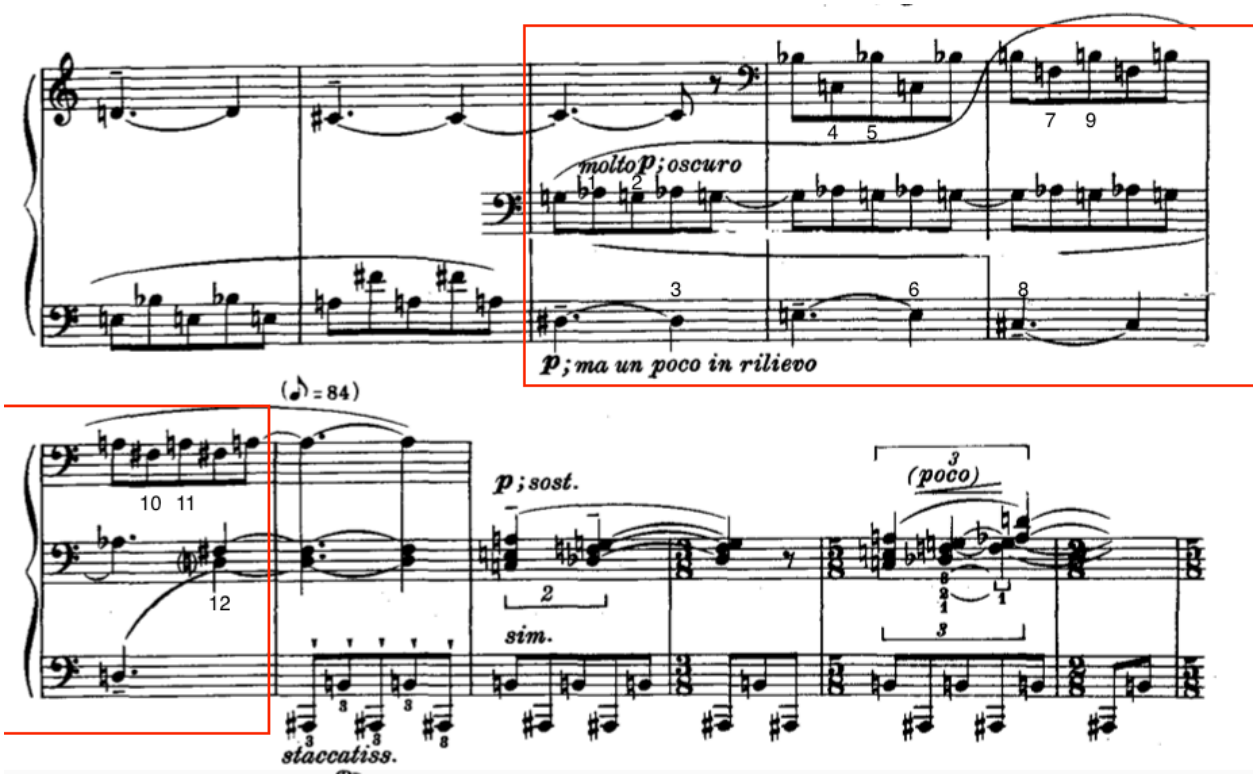
ordering of P7. It also begins after an eighth rest on the same exact pitches that end measure 26. Measure 28 flips back to the retrograde order of R7. It also begins on the same exact pitches that end the previous measure, but this time it is done by sharing those notes instead of by repetition. The next row beginning in measure 29 flips the order back to prime, P7. It begins on the same pitches that ended the previous row by sharing them.



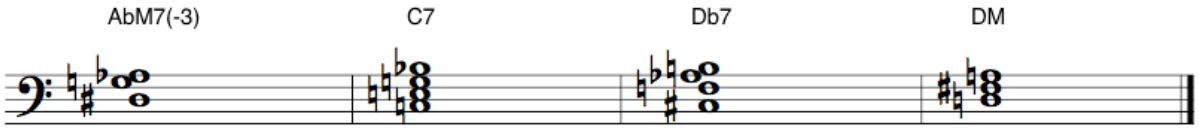
Example 17: mm. 25-27 chords.

The tonal references that have been so prevalent before continue through this section. I hear the shifting back and forth of the chords in measures 25-27 even more prominently than the shifting back and forth of the rows. Example 17 shows the chords on a single staff. The first chord in measure 25 sounds on the second eighth note. It is an Ab major seventh chord with a missing fifth in third inversion because the lowest note is actually the G in the right hand. The next chord is an F half-diminished seventh chord with a missing third in close position third inversion because the lowest note is once again the Eb in the right hand rather than the F in the left hand. The next chord is an E half-diminished seventh chord with a missing third in close root position. It finishes with an F# minor triad in root position stacked cleanly in thirds. Measure 26 contains the exact same harmonies, but of course in reverse order. The F# minor triad begins on the same pitches. The E half-diminished seventh chord contains the same pitches. The F half-

diminished chord contains the same pitches, however the Eb and the F have swapped hands in order to facilitate the new open voicing of the following Ab major seventh chord. For this chord, the Ab has switched hands, but is still the same pitch. The G moves up an octave and the C moves down an octave and switches to the left hand. Measure 27 contains the same chords, but they have reversed again to match the order in measure 25. They continue in the new open voicing introduced by the Ab major seventh chord. The exact same tonal references are grouped up in measure 28 in the same order found in measure 26, but I find them far more difficult to hear as chords. Beginning in measure 29, the same tonal references exist as are found in measures 25 and 27, but each one now takes up an entire measure because of the new texture.



Example 18: mm. 31-41, I8 boxed with order numbers.

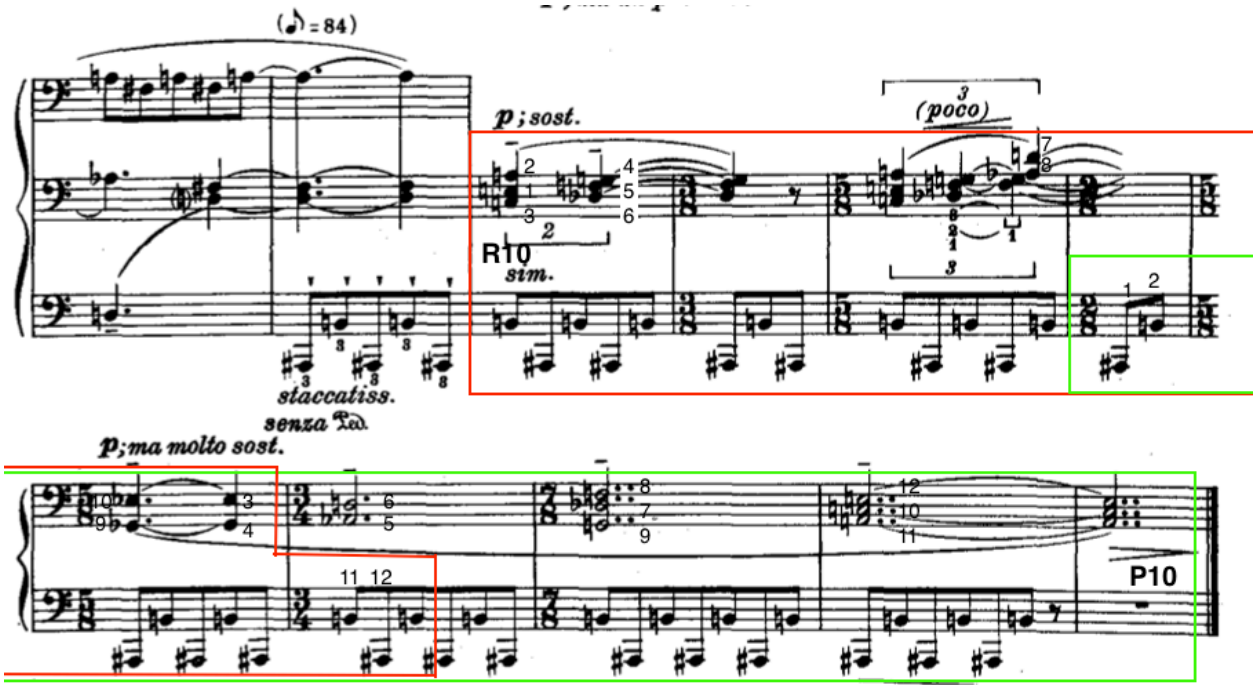


Example 19: mm. 33-36, I8 chords.

Measure 33 introduces a new row transformation, I8 <8730T451E692> (shown in example 18). This change sounds incredibly jarring to me after hearing the same row transformation forward and backward five consecutive times. The similar texture helps provide some continuity. What I hear providing the most continuity is the continuation of the tonal references. Example 19 shows the tonal harmonies found in this row condensed into a single staff. The first harmony in measure 33 is the same harmony that begins the P7 row forms in measures 25, 27, and 29 but with a missing third instead of a missing fifth. The D# in the bass can be respelled as Eb to create the fifth and make it a second inversion chord. The Ab and G are the root and seventh, leaving the third implied. A complete C dominant seventh chord in closed root position is in the next measure. The Ab repeated note, which is continued from the previous measure, serves as an upper neighbor to the G. The next measure is a complete Db dominant seventh chord in close root position. The C# is respelled as Db and the G repeated note continued from the previous two measures acts as a lower neighbor to the Ab. Measure 36 is a D major triad in close root position which concludes the B section.

The A' section begins in measure 37 where the tempo returns to the opening tempo of eighth note equals 84. The D major triad is tied over to provide a connection from the B section to the A' section. The interval-class 13 A#-B dyad returns in the left hand and the same sustained

chordal texture returns in the right hand. This makes it sound quite similar to the beginning, however the A' section is abbreviated, containing only two row forms. It starts with R10 <4907512863ET> – the retrograde of the row that begins the piece. The final row is P10 <TE3682157094>, which is the same row that begins the piece. These rows overlap in an interesting way. Due to P10 being the reverse of R10, they both utilize the eighth notes in the left hand to fulfill the <ET> and <TE> parts of their rows. Which ones in particular don't necessarily matter, but the eighth notes used to conclude R10 must occur after the Gb-Eb dyad in the right hand of measure 42 because those are <9> and <10> of R10. The eighth notes used for P10 must occur before the Gb-Eb dyad in the right hand of measure 42 because those are <4> and <3> of P10. Example 20 shows this unique overlap.



Example 20: mm. 36-46, R10 (red) and P10 (green) boxed with order numbers.

The A' section upholds the polarity of the movement and continues to have tonal references. Measure 38 in the right hand contains two chords. The first is an A minor triad in close position first inversion. This moves to a G half-diminished seventh chord with a missing third in close position second inversion. This is tied to measure 39. The third can be found in the left hand A# but to me it is so far away in pitch space and the repeated A#-B dyad sounds so much like its own unit at this point in the piece that it is not aurally connected as well as it was at the beginning of the piece. That there are three pitches in the right hand instead of two facilitates this perception as well.

P10 and the tonal references in it return at exact pitch levels from measure 42 to the end as are found in measures 2-5 which creates the same exact tonal references with the same exact ic1 relationships. There are slight differences. The beginning of the last row in measure 41 has only two eighth notes instead of four like in the beginning and the sustain of the last chord in measure 40 can still be heard over it. The final A minor chord is sustained for an entire measure – seven eighth notes – instead of for only two eighth notes like the beginning in measure 6. Even with these minor changes, this row sounds almost exactly the same to me as the first row, which is good because it is.

Luigi Dallapiccola's *Quaderno Musicale Di Annalibera, no. 1 – Simbolo* is a composition that I find to be in a form similar to a ternary ABA' form. The A section is from measure 1 to measure 16 which contains the first row and several different row forms. The B section begins in measure 17 at the tempo change and contains new ideas and greater diversions from the initial row. The A' section begins in measure 37. It is an abbreviated restatement of the A section. The most consistent element I hear throughout the work is the polarity of tonal references usually connected within each form by interval class 1 and sometimes between row forms.

Bibliography

Dallapiccola, Luigi. *Quaderno Musicale di Annalibera*. Milano: S.A. Edizioni Suvini Zerboni, 1953.

Straus, Joseph N. *Introduction to Post-Tonal Theory*. 3rd ed. Upper Saddle River, NJ: Prentice Hall, 2005.