Elliott Carter's Metric Modulation in Ether-Cosmos No. VIII

Wiboon Trakulhun

Conservatory of Music, Rangsit University, Pathum Thani, Thailand
Corresponding author, E-mail: wiboon.tr@rsu.ac.th, wbtrakulhun@gmail.com

Abstract

Ether-Cosmos comprises of twenty pieces for piano. The length of each piece is about 1-3 minutes, except the piece no. 18 which is longer than 12 minutes. For *Ether-Cosmos No. 8*, it is about 1.25 minutes in length. This piece applied music composition approach in the area of rhythm of Elliott Carter, especially in terms of metric modulation or tempo modulation. This approach involves a change of tempo within the music. The metric modulation also relates to note values or duration of notes, proportion of beat, and time signature. Therefore, the techniques of rhythmic organization and arranging tempos within metric modulation concept will be shown in this piece. Accordingly, the composer intends to design this piece with only one theme by arranging its structure as A1-A2-A3 and adding transition between each part until the end. Therefore, the audience can hear and compare the theme of the entire piece whose tempo is changed without feeling the change of tempo in the music.

Keywords: *Metric modulation, Tempo modulation, Musical meter, Elliott Carter, Ether-Cosmos*

1. Introduction

Ether-Cosmos No. 8 is a musical composition within "Ether-Cosmos Twenty Pieces for Piano" which is under the creative research project of "Ether-Cosmos: Piano Music Compositions for Analysis". The creative research was granted funding from the Thailand Research Fund (TRF) and National Research Council of Thailand (NRCT) in 2015. The composer composes each piece of this musical composition using the twentieth century music compositional methods including common music compositional techniques or the unique concept of important composers as pitch materials. *Ether-Cosmos No. 8* contains compositional concept of Elliott Carter, especially his highly individual approach to rhythm.

Guy Capuzzo (2012, p. 1) refers to Aaron Copland and also highly regards to Carter that "Hailed by Aaron Copland 'as one of American's most distinguished creative artists in any field' and two-time winner of the Pulitzer. Composer Elliott Carter ranked in the highest echelon of American Composer." Elliott Cook Carter Jr. was born in Manhattan, New York, on December 11, 1908. He attended at Harvard University in 1926 where he studied both English and music. In 1932, he also got master's degree in music at Harvard University. His professors were Walter Piston and Gustav Holst. In addition, while he was staying in Paris during 1932-1935, he applied to study in a composition class at the École Normale de Musique de Paris, where he studied with Nadia Boulanger.

In his life, he had lectured at many universities; St. John's College, Peabody Conservatory, Columbia University, Yale University, Cornell University, and Juilliard School. During World War II, he also served at the Office of War Information. In his career, he composed a lot of work for instrumental music, solo instrumental, chamber, large ensemble, concerto, and orchestra. Moreover, he also composed work for voices (both solo and accompaniment by instrument), choral, an opera (in one act), and two ballets. On November 5, 2012, he died at the ripe old age of 104 years old at his home in New York.

Elliott Carter innovated a new rhythmic method that employed "metric modulation" in his *Cello Sonata* (1948). Carter himself (cited in Schiff, 1998, pp. 20-21) explains:

"... I was preoccupied with the time-memory patterns of music and with rethinking the rhythmic means of what had begun to seem a very limited routine used in most contemporary and older Western music. I had taken up again an interest in Indian *talas*, the 'tempi' of Balinese gamelans (especially the accelerating *Gangsar* and *Rangkep*), and studied the newer recordings of African music, that of Watusi in particular. At the same time, the music of the *quattrocento*, Scriabin, Ives and the techniques described in Henry Cowell's *New Musical Resources* also furnished me with many ideas. The result was a way of evolving rhythms and rhythmic continuities sometime called 'metric modulation,' worked out during the composition of the *Cello Sonata* (1948)."

David Schiff (1998, p. 23) more describes, "Carter had found an idea which would take his music beyond the classical structures of European high modernism and the experiments of the American ultramodernists; that idea was change. ... Carter made a change to the musical structure through two procedures: metrical modulation and polyrhythm form." Stefan Kostka (2006, p. 130) also states that:

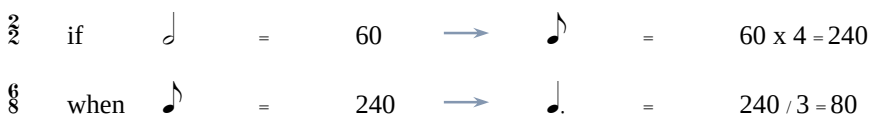
"Elliott Carter is generally credited with being the first to use a particular method of changing tempos precisely by making one note value in the first tempo equal to another note value (or at least to a different proportion of the beat) in the second tempo. ... This device has been called "metric modulation" because it usually involves changing time signatures. However, a change of tempo is the real objective, so we will use the term "tempo modulation." This technique does bear a resemblance to common chord modulation of tonal music, in that one or more measures will contain element of both tempos."

In briefly, George Peter Tingley (1981, p. 3) explains that "metric modulation is a precise and controlled method of proceeding from one metronomic speed to another." Tingley also continues (1981, p. 9) in his summary in Carter's *First String Quartet* (1951) that "metric modulation is a controlled method of speeding or slowing the pulse, thus rendering the beat supple and elastic." According to Leon Dallin (1974, p. 68) who describes, "In metric modulation a proportional change of tempo is accomplished by a change from one meter to another with the two meters linked by common value."

Although, Elliott Carter developed a variety of highly complex ratios and innovative temporal techniques, he didn't like to call his method that "metric modulation." The term was named by Richard Franko Goldman in 1951 (Wierzbicki, 2011, p. 36). Due to the fact that "the tempo that changes, not the meter" (Schiff, 1998, p. 23). Carter himself preferred to use the word "tempo modulation", but the term "metric modulation" has become popular word when refers to this procedure (Roig-Francoli, 2008, p. 264).

Consider if we would like to change the time signature from 2/2 to 6/8 by means of keeping feeling constant tempo as shown in Example 1 beginning with tempo 𝅗𝅥 = 60 (BPM or Beat per Minute).

Example 1 A simple metric modulation



Explanation if 𝅗𝅥 = 60 then ♪ 60 x 4 = 240

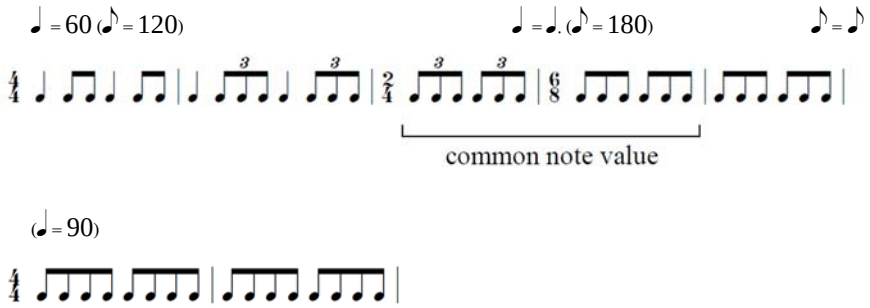
and then to figure out what is the beat in the next tempo:

if ♫. ♩. then ♩. 240 / 3 = 80

Therefore, 𝅗𝅥 = 60 equals ♩. = 80 as ♪ represents the same tempo at 240 but the time signatures 2/2 and 6/8 will be emphasized on different tempos.

Consider another case as shown in Example 2 which changed both tempo and time signature by using a group of rhythmic fragments as a group of common note values.

Example 2 A complex metric meter



Explanation	if	♩ = 60	then	♪	60 x 2 = 120
	m. 4	♩ = ♩.	then	♪	60 x 3 = 180
	So, m. 6	♪ = ♪	then	♩	180 / 2 = 90

Initially considering from ♩ = 60 (♪ = 120) which the mm. 2-3 used eighth note triplets in simple time signatures (4/4 and 2/4) and the m. 4 changed to compound time signature. Therefore, eighth note triplets became eighth note (normal) and there were 3 notes in a group of rhythmic fragments of each measure. In this area, eighth note triplets (in simple time of m. 3) equaled eighth notes (in compound time of m. 4). Consequently, quarter notes (in simple time of m. 3) also equaled dotted quarter notes (in compound time of m. 4). Therefore, between mm. 3-4, the tempo was ♩ = ♩. (♪ = 180), and then m. 6 changed to simple time again be means of remaining the same tempo of eighth notes. Thus, the tempo of m. 6 was ♩ = 90 (180 / 2).

2. Result and Discussion

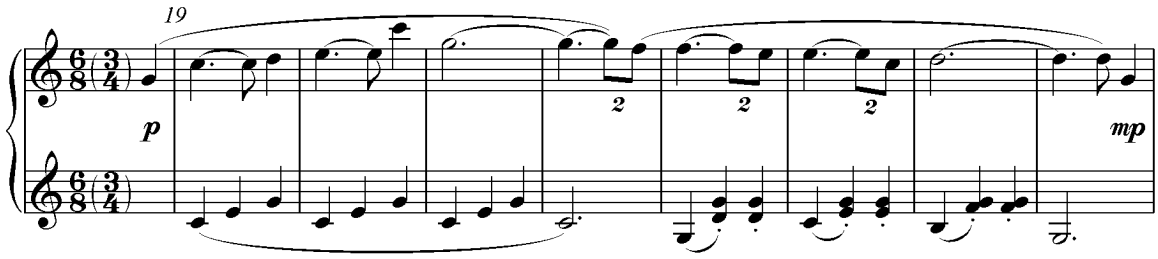
Ether-Cosmos No. 8 presents balanced and simple melody. Moreover, its harmonic progression is also under functional harmony which imitates music composition approach of the Classical Era. Therefore, the musical system of this piece strongly belongs to tonality. However, within the balance and simplicity, this piece applied tempo as pitch materials especially tempo modulation or metric modulation which is the technique of shifting tempos and time signatures.

The length of this piece is about 1.25 minutes long. There is only one theme on its structure that appears 3 times (sections); A1 in mm. 1-8, A2 in mm. 19-34, and A3 in mm. 46-57, integrated with the first transition in mm. 9-18, the second transition in mm. 35-45, and in the codetta mm. 58-61. The parallel period of section A1 is under simple time signature 4/4 with the tempo ♩ = 108 (♪ = 216). This section applies normal notes until the first transition (playing like scales) mm.11-13. Then, eighth note triplets are applied instead.

Then, at the last segment of the first transition (mm. 14-16), time signature is changed to 6/8. Moreover, at mm. 17-18, two time signatures are applied at the same time which are 6/8 and 3/4 using polymeter approach. The right-hand melodic line is compound 6/8 whereas left-hand horizontal harmony is simple time 3/4. Variation technique is used while coming to section A2. This is because the melody remains the same but the polymeter

approach is still continued from the first transition (Example 3). The tempo becomes normal again in the second transition using compound 6/8 time signature by means of playing scales as in the first transition.

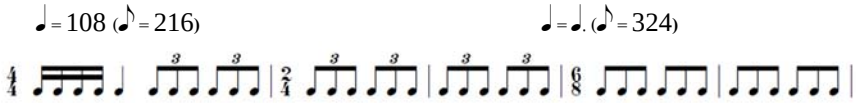
Example 3 Melodic variation and polymeter



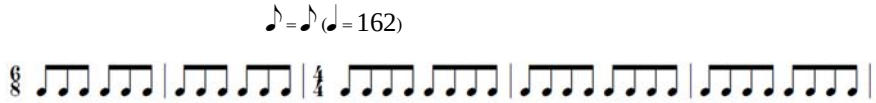
In section A3, the melody and harmony remain the same, but the length is longer by repeating the whole second phrase. However, in the last part of section A3, the time signature is changed to 4/4 but a new and faster tempo is applied at ♩ = 162; whereas the last part of codetta applies playing scales and vertical harmony. The techniques of rhythmic organization and arranging tempos within metric modulation concept of this piece have been shown in Example 4.

Example 4 Metric modulation organization

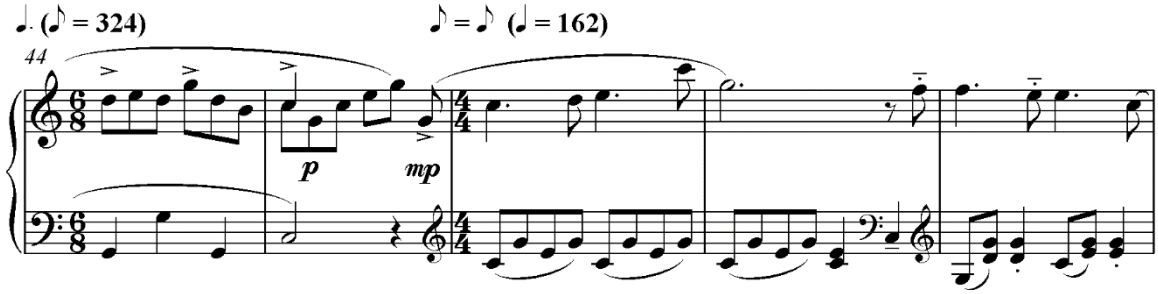
mm. 11 - 15



mm. 44 - 48

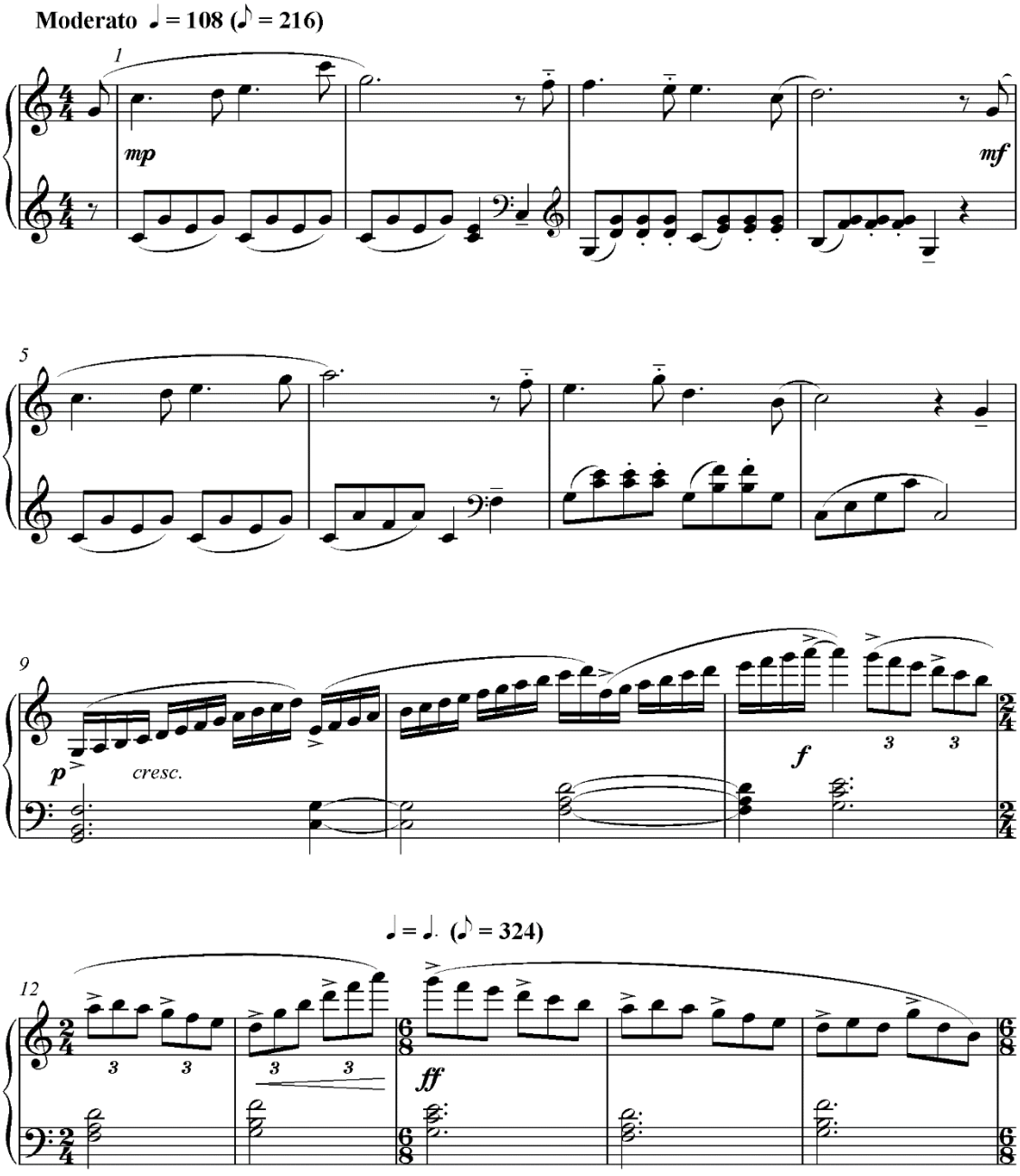


Explanation	if		then		
	m. 14	♩ = ♩.	then	♪	108 x 2 = 216
	m. 49	♪ = ♪	then	♩	324 / 2 = 162



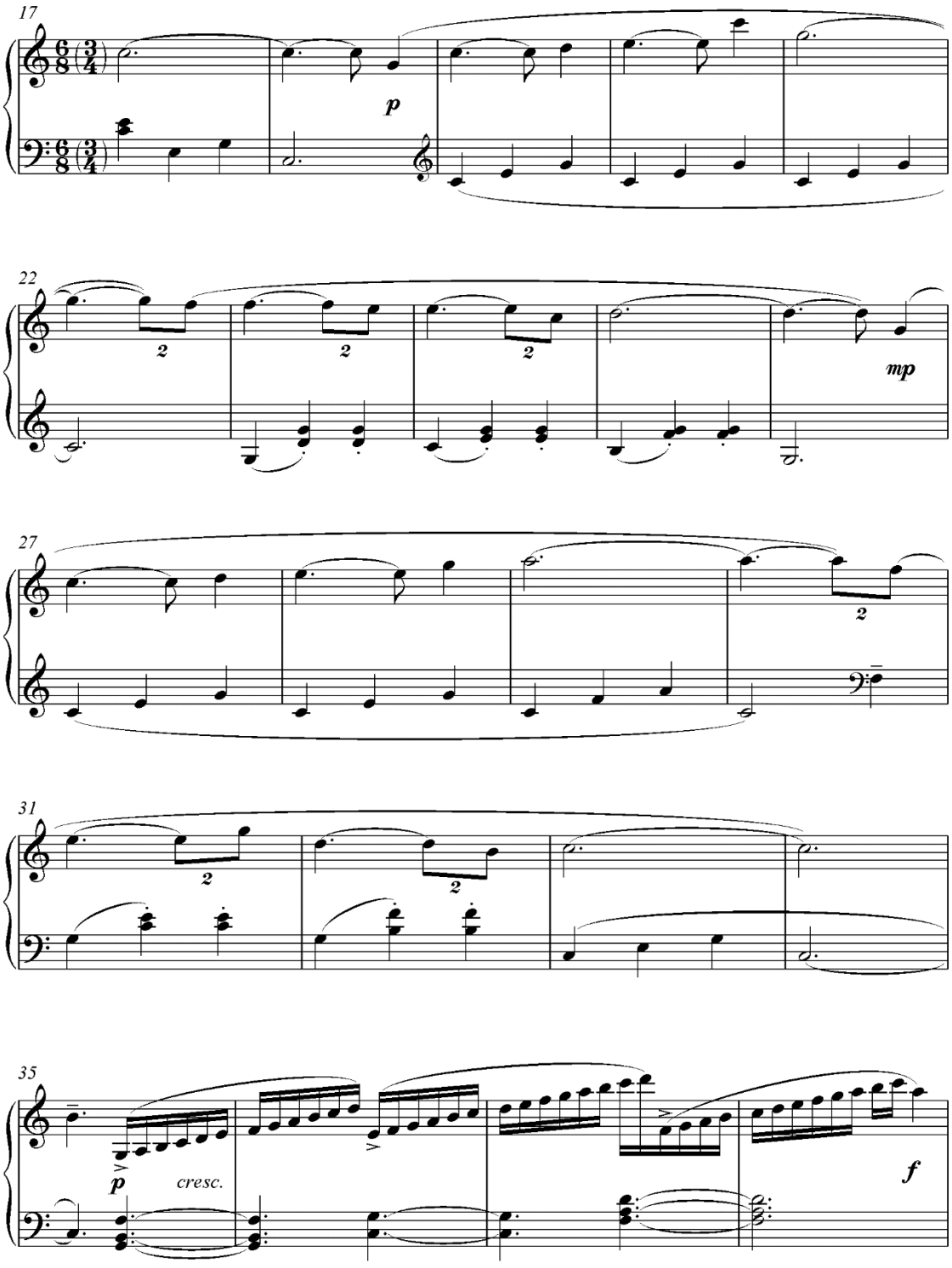
Ether-Cosmos VIII

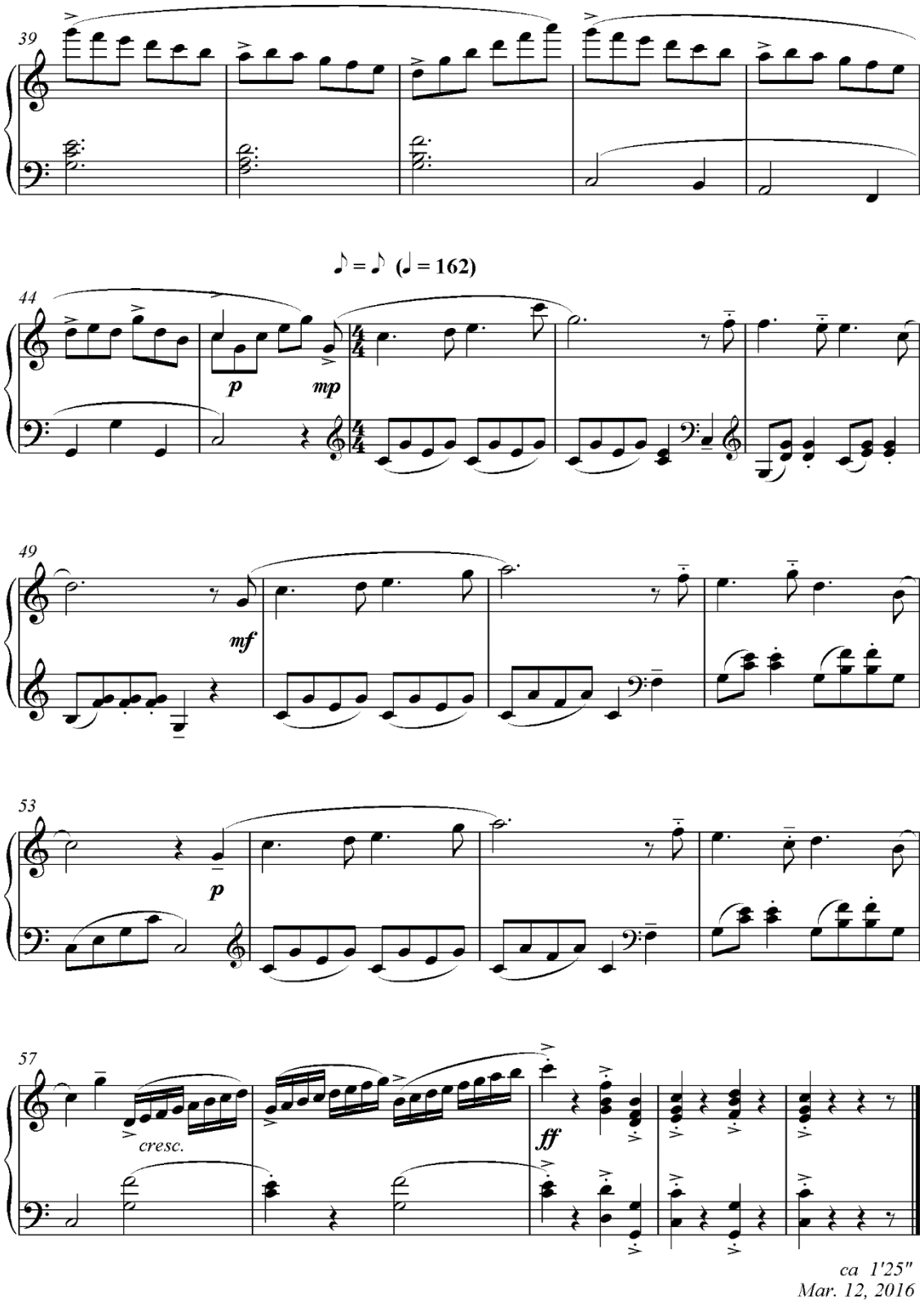
Wiboon Trakulhun



The score derives from Trakulhun (2016), *Ether-Cosmos twenty pieces for piano*, pp. 39-41.

Proceedings of RSU International Research Conference (2020)





ca 1'25"
Mar. 12, 2016

3. Conclusion

This piece, the composer intends to use only one theme in order to the audience could compare differences between tempo in section A1 and A3. While the melody is continuing together with changing its tempo, the composer applies a group of rhythmic fragments as a group of common note values and shifts between simple and compound time signatures. Therefore, the audience can feel the simple tempo or perhaps cannot feel any changes of tempo within the melody.

Some part of Tingley's summary in Carter's *First String Quartet* (1951), he describes (1981, p. 9) that "metric modulation makes possible the departure and return of tempos, which constitute an essential and integral part of the work's design (analogous, in this respect, to the modulation of keys in tonal music)." According to David Schiff that highly regarding to Carter's tempo modulation, he (1998, p. 23) states that:

This change usually happens with no break in the music, but it makes possible new cross-rhythmic relationships which can give rise to other seamless tempo changes. By these means, the tempo of music becomes its most dynamic element. Carter achieved a rhythmic flexibility that contrasted sharply with the unvarying tempi of neo-Classical Stravinsky, though it had precedent in Ives and Berg.

The concept of metric modulation applies more specifically to change tempo to another. In some cases, a note value from the first equals to a note value in the second, but other cases a note value in the first tempo equals to a different note value in the second tempo. However, both cases usually have a common note value serve as a bridge (or transition) between two tempos. Moreover, metric modulation directly involves the change of time signatures or meters simple time and compound time, including complex time. Sometimes, it may use tuplets or grouplets especially using of polyrhythm and/or polymeter. These elements can make the first tempo smoothly turns into the next tempo. The term "modulation" reminds of familiar term using in analysis of common practice, which is melody and/or harmony usually serves as the bridge between two keys. Therefore, both functions are similar, but different in situations for distinguish conditions of.

Ether-Cosmos, twenty pieces for piano, is quite flexible. In many pieces, the composer gave opportunities for pianists to freely interpret the music such as emotions of the music, choices of piano pedals, using right or left hand on different melodies, flexibility of tempo, etc. Furthermore, the composer intended to have each piece played at intermediate level (or a little higher) because the music might be taught by those who weren't pianists. Consequently, they could play for students. However, there are some requirements that pianists should follow due to the concept of musical composition. For example, in *Ether-Cosmos No. 8*, the tempo modulation technique was applied, so pianists should strictly follow all indicated time signatures.

4. World Premiere

Ether-Cosmos Twenty Pieces for Piano was presented as a lecture-recital. The 20 compositions were premiered on August 31, 2016 at Auditorium Building 11, Rangsit University. *Ether-Cosmos No. 8* was performed by Assistant Professor Dr. Pimchanok Suwannathada.

5. Acknowledgement

Ether-Cosmos No. 8 is a musical composition of twenty pieces for piano that is under the creative research project, Ether-Cosmos: Piano Music Compositions for Analysis. The creative research was granted funding from the Thailand Research Fund (TRF) and National Research Council of Thailand (NRCT) under the Humanities Research Funds for the Arts (2015). The creative research received the National Outstanding Research Award from NRCT in 2017.

6. References

Capuzzo, G. (2012). *Elliott Carter's What Next?: Communication, cooperation, and separation*. Rochester, NY, University of Rochester Press.

Dallin, L. (1974). *Techniques of twentieth century composition: A guide to the materials of modern music*. 3rd ed. Boston: WCB/McGraw-Hill.

Kostka, S. (2006). *Materials and techniques of twentieth-century music*. 3rd ed. Upper Saddle River, NJ: Prentice Hall.

Roig-Francoli, M. A. (2008). *Understanding post-tonal music*. Boston: McGraw-Hill.

Schiff, D. (1998). *The music of Elliott Carter*. 2nd ed. Ithaca, NY: Cornell University Press.

Trakulhun, W. (2016). *Ether-Cosmos twenty pieces for piano*. Bangkok: Tana Press. (In Thai)

Trakulhun, W. (2017). Ether-Cosmos. *Rangsit Music Journal, 12*(1), 103-112. (In Thai)

Tingley, G.P. (1981). Metric modulation and Elliott Carter's "First String Quartet." *Indiana Theory Review, 4*(3), 3-11.

Wierzbicki, J. (2011). *Elliott Cater*. Urbana, IL: University of Illinois Press.