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*Corresponding author:
Rafael Dimas Prabowo,
Institut Seni Indonesia,
Yogyakarta, Indonesia

E-mail:
rafaelprabowo2636@gmail.
com

Application of Astrological Idioms to Twelve Tone Series Technique: Composition “BEYOND 12”

Rafael Dimas Prabowo^{1*}, Puput Pramuditya², Nugrahanstya Cahya Widyanta³

^{1,2,3}Institut Seni Indonesia, Yogyakarta, Indonesia

Abstract: This study integrates astrological idioms into musical composition using the twelve-tone series technique. The connection between the two is based on the similarity in the number of variables—namely 12—as well as the principle of equality. In the twelve-tone series, all 12 notes are treated equally without any tonal hierarchy, while in astrology, the ecliptic circle is divided into 12 zodiac signs with equal angles. The creative process includes idea formulation, title determination, literature review, and concept development before being realized in a musical composition. The method used is correlative exploratory and implementation, linking variables to form the basis of serialist composition. The creative strategy follows the movement patterns of the sun and moon in the ecliptic, which is divided into 4 quadrants. These quadrants serve as the foundation for the number of movements and series transformations. The melody in each movement is arranged according to zodiac groups, corresponding to their elements and angles within the geocentric cycle of the sun's and moon's movement.

Keywords: astrological idioms, twelve-tone series, the sun's and moon's movement, zodiac, series transformation

1. INTRODUCTION

This research was motivated by several factors, the first being the connection between the number of variables in astrology—namely, the 12 signs of the zodiac—and the 12 tones that serve as the foundation for the twelve-tone series technique. The twelve-tone series technique, also known as twelve-tone music, is a method developed by the Austrian composer Arnold Schoenberg in the early 20th century to compose atonal music—that is, music not centered on a single specific note. This innovative approach emerged in the 1920s and represented a major shift from the tonal musical tradition that had dominated Western classical music for centuries. This technique involves the use of a twelve-tone series, which is a specific sequence of all twelve notes in the chromatic scale arranged by the composer. When creating a composition using the twelve-tone series technique, the composer must avoid repeating notes until all twelve notes have been used, thereby ensuring a balance among those notes (openmusictheory.github.io).

The connection between astrology and music is not merely due to the similarity in the number of notes and zodiac signs, but there is also an overlap in history and a shared set of principles. The historical connection between astrology and music can be traced back to one figure who bridged these two disciplines: Pythagoras. Pythagoras was a Greek philosopher and religious teacher who lived in the mid- sixth century BCE. It is said that he heard hammers of different weights striking a blacksmith's anvil, after which he conducted experiments on the strings of a monocord. He then



discovered that musical consonances could be represented through ratios derived from the tetractys (1, 2, 3, 4), a sequence of numbers he regarded as the mystical source of all things. In music, the frequency ratios 2:1 (and 4:2) correspond to an octave; 3:1 with an octave plus a fifth; 4:1 with a double octave; 3:2 with a fifth; and 4:3 with a fourth (Pesic, 2014: 27–30).

From the perspective of the history of astrology, Pythagoras asserted that the mathematical ratios in music that define pure intervals align with the movements of the planets and stars, thereby producing the harmony of the universe. This assertion is known as the concept of *Musica Universalis* (Agro, 2023: 15). The ratios of pure intervals discovered by Pythagoras formed the basis of the Pythagorean tuning system, which evolved into the equal temperament tuning system used today (Duffin, 2007: 3–5). Equal temperament (ET), simply put, is a tuning system in music in which an octave is divided into 12 exactly equal intervals called semitones. This system ensures that all notes have the same frequency interval from one another, thereby allowing music to be played with consistent intervals across all scales. Temperament is the method of tuning notes in a scale using intervals that have been modified (tempered) from their pure forms. The purpose of temperament is none other than utility—that is, to create a tuning system that is more useful in a wider range of musical situations (Duffin, 2007: 17–19).

2. METHODS

The correlation between the two variables—beginning with the observation of similarities in the number of objects and examined from a historical perspective—led the author to discover a common underlying principle. This common principle can be seen in equal temperament, the zodiac circle, and the twelve-tone series. Equal temperament is based on the principle of dividing an octave into 12 equal semitones, in line with astrology, which divides the ecliptic circle into 12 zodiac signs with equal angular divisions. This principle of equality is also the spirit championed by Arnold Schoenberg in the twelve-tone series, which treats the 12 chromatic notes in the equal temperament system equally, thereby avoiding a tonal hierarchy. The equality of the 12 notes in the twelve-tone series is symbolically parallel to the zodiacal cycle, in which no single sign dominates the cosmic order (Heyning, 2015: 26). Therefore, the author formulated the creative concept of composing a piece by applying astrological idioms to the twelve-tone series technique as a tool in the musical composition “Beyond 12.”

Unlike previous research and compositional practices—such as those of Kardinsky, Scriabin, Klint, Gustav Holst, and others—which generally utilized astrology as a source of symbolic or narrative inspiration (Lachman, 2002: 77), this study integrates astrological elements directly into the pitch-organizational system of serialism. Thus, astrology not only serves as a compositional theme but also forms the basis for the creation of musical structure through the transformation of the twelve-tone series.

In conducting this research, the author employed several methods, namely the correlational explanatory research method and the implementation method (Smith & Dean, 2009: 47–58). The author sought to identify correlations between the two variables—the material objects—in the research topic under consideration, namely astrological idioms and the twelve-tone series technique. The results of the correlation analysis between these two variables

were then integrated to form a foundation that would be used for implementation in the form of a musical composition (Given, 2008: 137). This research was conducted in four main stages.

The first stage involved the identification and collection of conceptual data regarding astrology, specifically the structure of the zodiac, the elements, and the patterns of the sun's and moon's movements along the ecliptic. The second stage involved the collection of musical data related to the twelve-tone series technique, including the concepts of prime, inversion, retrograde, and retrograde inversion. The third stage was the correlation process, which involved linking the similarities in principles and structures between the two variables to form the zodiac system as a conceptual model. The fourth stage was the implementation of the results of this correlation into the process of creating musical compositions through the arrangement of structure, series transformation, pitch processing, texture, and orchestration.

3. RESULTS AND DISCUSSION

3.1 *Composing Process*

The creative process behind the composition "Beyond 12" began with the development of creative ideas that led to concepts which were then realized as works of art. In explaining the creative process, the author divides it into several chronological stages: formulating creative ideas, determining the title, observation, defining the concept and basic musical sketches, and applying astrological idioms using the twelve-tone series technique.

The concept behind this composition stems from the author's interest in astrology. The author envisioned creating a composition that combines astrological and musical elements. The author observed a connection in the number of variables in astrology—namely, the 12 signs of the zodiac—with the twelve-tone series developed by Arnold Schoenberg, which uses 12 notes as its foundational material. The relationship between astrology and music is not merely due to the similarity in the number of notes and zodiac signs, but also stems from historical connections and shared principles. The historical connection between astrology and music converges on one figure who bridges these two fields: Pythagoras. Pythagoras asserted that the mathematical ratios in music—which define pure intervals—align with the movements of the planets and stars, thereby producing the harmony of the universe. This assertion is known as the concept of "Musica Universalis".

The ratios of pure intervals discovered by Pythagoras formed the basis of the Pythagorean tuning system, which evolved into the equal temperament tuning system used today. Equal temperament is based on the principle of dividing an octave into 12 equal semitones, in line with astrology, which divides the circle of the ecliptic into 12 zodiac signs with equal angular divisions. This principle of equality is also the spirit championed by Arnold Schoenberg in his twelve-tone series, which treats the 12 chromatic notes in the equal temperament system equally, thereby avoiding a tonal hierarchy. The equality of the 12 notes in the twelve-tone series is symbolically parallel to the zodiac cycle, in which no single sign dominates the cosmic order. Therefore, the author formulates the idea of creation—that is, composing music by applying astrological idioms using the twelve-tone series technique.

In this composition, the composer chose to use a string quartet consisting of first violin, second violin, viola, and cello because these four instruments have a uniform timbre and a

minimalist format. This uniformity of timbre provides an opportunity for broader exploration of the resulting playing techniques. Such exploration can produce distinctive sounds (Brindle, 1977: 124). The work created by the composer consists of both aleatoric and non-aleatoric sections. The author uses both 20th-century modern notation and conventional notation. Aleatoric notation is a system that incorporates elements of uncertainty into certain musical parameters (Skowron, 2007: 25–32). To accommodate the aleatoric sections, the composer uses 20th century modern notation, which is written without bar lines or horizontal lines to indicate duration, and employs specific symbols to denote playing techniques.

The composer specifies only the pitch and rhythm; the duration of each note is left to the discretion of the instrumentalist. The composer also provides performance notes containing interpretations of the symbols found in the aleatoric notation. The non-aleatoric sections use conventional notation (Stone, 1980: 24). The piece "Beyond 12" opens with low musical intensity and then gradually builds until it reaches a climax of high musical tension. After the climax, the piece concludes with an anticlimax characterized by low musical intensity (Adler, 2002: 558).

3.2 Applying Astrological Idioms Using the Twelve-Tone Series Technique

In this section, the author will explain the strategy for applying astrological idioms to the twelve-tone series technique, which is used as a tool in the musical composition "Beyond 12." The astrological idioms used are the patterns of the sun's and moon's movements along the ecliptic from a geocentric perspective (clockwise). The twelve-tone series techniques used are inversion, retrograde, inverted retrograde, and permutation.

The ecliptic is represented by a circle. The four quadrants symbolize the four phases of the Sun's and Moon's movement within the ecliptic plane, starting at 0°, passing through 90°, 180°, and 270°. As the Sun and Moon move through one cycle (one circle), they pass through the 12 zodiac constellations, each of which has a different element. These elements are divided into four categories: fire, earth, air, and water. In order, the 12 zodiac constellations and their corresponding elements are Aries (fire), Taurus (earth), Gemini (air), Cancer (water), Leo (fire), Virgo (earth), Libra (air), Scorpio (water), Sagittarius (fire), Capricorn (earth), Aquarius (air), and Pisces (water). The pattern of their movement begins at 0°, which corresponds to the fire element, then 90° to the water element, 180° to the air element, and 270° to the earth element, until it reaches 360°, completing one full cycle.

For each zodiac sign, the author, as a composer, determines a different pair of notes for each sign, which, when arranged from 0° to 360°, form a prime series (prime 0). The sequence of notes in this prime series is E – Eb – D – Ab – A – C – B – Bb – G – F – F# – C#. The author integrates the angles, zodiac signs, notes, and elements into a concrete form known as the tone-zodiac. The tone-zodiac is a visual and symbolic representation of the belief that the cosmos possesses a harmonious structure that can be reflected in musical aspects based on the Pythagorean-Platonic vision (Heyning, 2015: 3). As a composer, the author created his own tone-zodiac, which he named "Beyond 12 Tone- Zodiac" (see Figure 1).

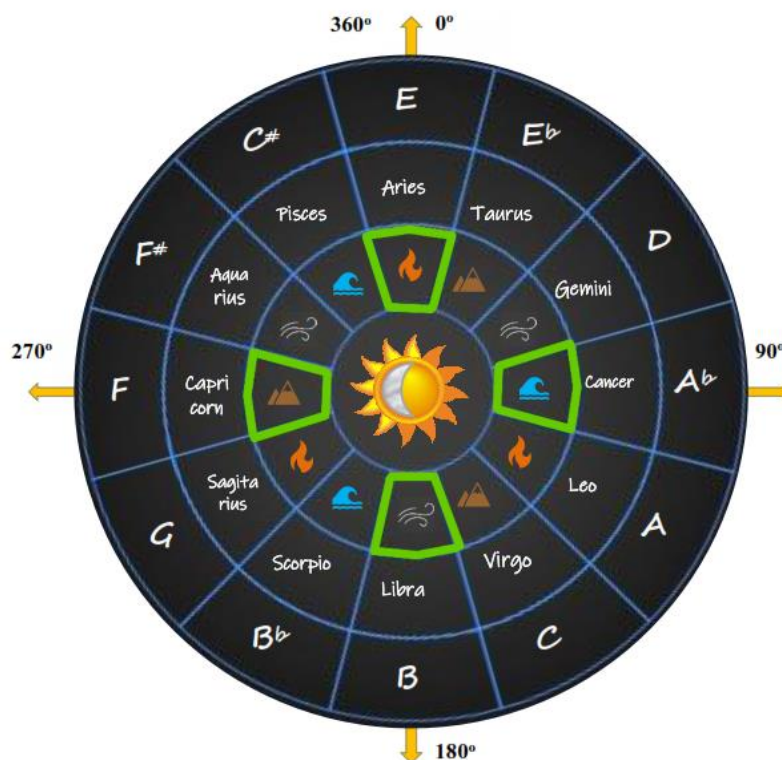


Figure 1. Beyond 12 tone zodiac

The strategy of correlating the movement patterns of the sun and moon on the ecliptic plane from a geocentric perspective with the twelve-tone series technique does not stop at the tone-zodiac alone, as it has not yet incorporated various types of series transformations. The four angular stops that coincide with specific elements are paired with forms of the twelve-tone series technique: 0° fire element (original series), 90° water element (retrograde form), 180° air element (inversion form), and 270° earth element (inverted retrograde form).

Astrological idioms in this composition serve as the foundation related to structure and pitch. The entire composition "Beyond 12" consists of four movements, which represent the four phases of the sun and moon's motion along the ecliptic from a geocentric perspective. Each phase moves in a circle at an angle of 90°. Each phase begins at and passes through a specific angle and a specific element. These elements form the basis for the series used in each section of the composition. The results of applying astrological idioms to the twelve-tone series technique as a tool in the musical composition "Beyond 12" are visualized in the following [table 1](#).

Table 1. The structure, composition, and transformation of the series used

0°	90°	180°	270°	360°/0°
Fire	Water	Air	Earth	
↓	↓	↓	↓	
Aries Leo Sagittarius	Cancer Scorpio Pisces	Gemini Libra Aquarius	Taurus Virgo Capricorn	
(Prime Series)	(Retrograde)	(Inversion)	(Inverted retrograde)	

P 0	R 0	I 0	IR 0
Q 1	RQ 1	IQ 1	IRQ 1
Q 2	RQ 2	IQ 2	IRQ 2

In the first movement, the movements of the sun and moon begin their cycle at 0°, which coincides with the zodiac constellation Aries, associated with the element of fire. The sequences permitted for the first section are those associated with the fire signs of the zodiac: Aries, Leo, and Sagittarius. The Aries sequence is derived from the original sequence already placed on the tone-zodiac (see Figure 1), which is read clockwise. The sequences for the zodiac signs Leo and Sagittarius begin with the notes assigned to those zodiac signs on the tone-zodiac. Therefore, in determining the scales used for the Leo and Sagittarius zodiac signs based on the tone-zodiac, the technique of permutation has indirectly been used, which is symbolized by the letter "Q" in the table. Thus, the scales used as material in Section One are as follows.

- 1) Aries: E – Eb – D – Ab – A – C – B – Bb – G – F – F# – C#
- 2) Leo: A – C – B – Bb – G – F – F# – C# – E – Eb – D – Ab
- 3) Sagittarius: G – F – F# – C# – E – Eb – D – Ab – A – C – B – Bb

After moving from an angle of 0° in the composition's first movement, the sun and moon reach an angle of 90°, which corresponds to the zodiac sign of Cancer, a water sign. When the direction of movement stops at the water element, the twelve-tone series technique used is retrogradation. Retrogradation is the transformation of the original series by arranging it in reverse order, from the last to the first. The series played in the second section consists of the zodiac signs with the water element, namely Cancer, Scorpio, and Pisces. The Cancer series is derived from the original series (the Aries series) through a transformation technique known as retrogradation. The Scorpio series is derived from the retrogradation of the Leo zodiac series, while the Pisces series is derived from the retrogradation of the Sagittarius zodiac series. Thus, the series used as material in the first section are as follows.

- 1) Cancer: C# – F# – F – G – Bb – B – C – A – Ab – D – Eb – E
- 2) Scorpio: Ab – D – Eb – E – C# – F# – F – G – Bb – B – C – A
- 3) Pisces: Bb – B – C – A – Ab – D – Eb – E – C# – F# – F – G

The third movement in the work "Beyond 12" represents the phase in which the movements of the moon and sun pass through an angle of 180°, which corresponds to the element of air. The twelve-tone series technique used is the inversion method. Inversion involves processing the original series by reversing all its intervals (moving in the opposite direction from the original series). In this third section, the series used is the zodiac series associated with the element of air, namely, Gemini, Libra, and Aquarius. The Gemini series is derived from the inversion of the original series. The Libra series is derived from the inversion of the original series that undergoes the first permutation (the Leo series). The second permutation of the original series is used for Aquarius, so the series used in the third section are as follows.

- 1) Gemini: E – F – F# – C – B – Ab – A – Bb – C# – Eb – D – G
- 2) Libra: A – F# – G – Ab – B – C# – C – F – D – Eb – E – Bb
- 3) Aquarius: G – A – Ab – C# – Bb – B – C – F# – F – D – Eb – E

The fourth movement is the final part of the composition "Beyond 12." This section represents the phase when the movements of the sun and moon, after passing through three quadrants, reach an angle of 270° and proceed toward 360°.

completing one cycle. The 270° angle corresponds to the earth element. The sequence used in the fourth movement is the zodiac sequence associated with the earth element: Taurus, Virgo, and Capricorn. In this section, the movements of the moon and the sun will return to 360°/0°, which is the starting point of their movement. Therefore, the final sequence used is the original series because it has the fire element and corresponds to the 360°/0° angle. The sequence transformation used in the fourth section is the inverse retrograde of the sequences used in the first section (fire element), or, in other words, the retrograde of the sequences used in the third section (air element). The sequences used as material in the fourth section are as follows.

- 1) Taurus: G – D – Eb – C# – Bb – A – Ab – B – C – F# – F – E
- 2) Virgo: Bb – E – Eb – D – F – C – C# – B – Ab – G – F# – A
- 3) Capricorn: E – Eb – D – F – F# – C – B – Bb – C# – Ab – A – G

3.3 Theoretical Framework

The application of astrological idioms in this composition involves only the areas of structure and pitch. Therefore, theories are needed to serve as a foundation for implementing the tone-zodiac into serialist music. The author uses the theory of the Twelve-tone series, as outlined in the book "Serialism Composition", written by Reginald Smith Brindle in 1977, and the book "Analyzing Atonal Music" by Schuijjer in 2008. In composing serialist music, there are three main principles that must be considered, as follows.

1. Using orchestration that takes into account aspects of timbre and texture (Schuijjer, 2008: 29).
2. Creating contrast.
3. Maintaining atonal balance by using various compositional techniques (Schuijjer, 2008: 45).

To achieve the three points mentioned above, Brindle offers several recommendations that are emphasized in the creation of serialist musical compositions. The recommendations provided are as follows.

1. Avoiding traditional tonal implications, that is, avoiding the repetition of notes that lead to traditional tonal patterns or overly conventional melodic movements, as well as avoiding strong intervals such as consecutive major or minor triads, or clearly discernible diatonic scales. This is done with the aim of creating a series that is tonally neutral (Brindle, 1966: 18–19).
2. Avoiding excessive repetition of the same interval. Although not entirely prohibited, the repetition of the same interval within a series can reduce the series' variation and unique character (Brindle, 1966: 18–19).
3. Incorporating a variety of intervals. A well-structured series ideally contains various types of intervals (major, minor, augmented, diminished) to provide richer harmonic and melodic potential, thereby offering more numerous and sonically more interesting combinations (Brindle, 1966: 18–19).
4. Consideration of melodic character: Although a series is essentially a sequence of intervals, taking melodic character into account can produce variations in melodic contour and phrasing potential (Brindle, 1966: 18–19).
5. Maintaining balance and symmetry (optional). This creates coherence and unity throughout the entire work (Brindle, 1966: 18–19).

When creating a series, there are no strictly fixed rules. The main goal is essentially to produce coherent and expressive material.

3.4 Analysis of a Work

The author will not explain the entire process of creating the work, but will only explain the process of creating one part of the work, namely Movement I 0°.

Movement I is the section where the directional phases of the sun and moon begin their cycle, moving from an angle of 0° toward an angle of 90°. Referring to Beyond 12 Tone-Zodiac (see Figure 1), the 0° angle corresponds to the element of fire, so the scales used are zodiac scales associated with the fire element, such as Aries, Leo, and Sagittarius. The Aries series is the original series, while the Leo and Sagittarius series are permutations of the original series whose note sequences are calculated based on the tone-zodiac, starting from their respective notes and paired zodiac signs. Repetition follows the correct sequence of the scales. If the performance stops at the Sagittarius scale, it resumes from the beginning in the order of Aries, Leo, and then Sagittarius. The tonal structure of the zodiac scales used in Movement I is as follows.



Figure 2. The sequence used in Movement I (Author, 2025)

In accordance with the concept established by the author, Movement I is a movement with low musical tension and an aleatoric character. The Aries scale (natural scale) is the scale that begins this movement. To achieve this low musical tension, the composer does so by employing appropriate musical elements, such as a slow tempo, soft dynamics, and a warm timbre. At the beginning of Movement I, the composer places a long E note on the cello with a *p* dynamic and the *sul tasto* technique. The *sul tasto* technique involves bowing the strings above the fingerboard (Strange & Strange, 2001). This is done because the cello has a warm and deep timbre, which creates emotional calm and stability, supported by the sustained note (Nikolay, 1964: 36). The combination of *p* dynamics with the *sul tasto* technique applied to the E note is intended to produce a soft sound. It is this softness and tranquility that are the perfect characteristics for conveying low musical intensity. The notes Eb and D are made shorter in duration to anticipate any sense of boredom caused by the previous long note, while still maintaining the dynamics and technique (see Figure 3). The color red indicates the Aries sequence, while the color green indicates the Leo sequence.

Figure 3. Notation for Movement 1, Page 1 (Author, 2025)

After completing the Leo series, the composer moves on to the Sagittarius series. The dominant approach in this series is the creation of harmony. The composer creates harmony using several notes in the final sequence. The notes E – Eb – D – Ab are arranged using the horizontal-vertical method, but the vertical relationships are arranged from bottom to top with a crossing register (cello – violin 2 – viola – violin 1), with the notes introduced one by one. The composer's aim in doing this is to achieve a blending of sounds within the harmony. The final four notes— A–C–B–Bb—are also arranged to form a harmony using the strict vertical ordering technique, arranged from the low register to the high register. (Brindle, 1966: 80–81). The composer treats the last four notes with different playing techniques to achieve contrasting timbral variations (see Figure 4). The abundance of long notes, the smooth

timbre, and the soft dynamics in this first movement represent low musical tension, yet must achieve the goal of producing balanced and dynamic music. This goal is realized through orchestration techniques that do more than simply distribute notes among instruments; they also take timbre into account by exploring contrasting playing techniques and textural variations. (Brindle, 1966: 12)

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Figure 4. Notation for Movement 1, Page 2 (Author, 2025)

3.5 Evaluation of the Results of Applying the Method

The application of astrological idioms to the twelve-tone series technique results in compositional structures with a high degree of conceptual coherence. The zodiac tone system provides a systematic framework for determining the transformation of the series, the distribution of pitch material, and the division of movements within the composition. In addition to producing a diverse range of musical material, this approach also helps maintain consistency in the relationship between extramusical concepts and musical structure. Thus, astrology functions not only as thematic inspiration but also as a musical organizational device that directly influences the compositional process. The method developed in this study can be used as an alternative approach for composers who wish to integrate extramusical concepts into serialist music. The zodiac tone system can be modified according to each composer's artistic needs, whether through the use of different instruments, the expansion of musical parameters beyond pitch, or its application to larger ensemble formats.

4. CONCLUSION

Based on the results of the research conducted by the author, the author concludes that astrological idioms can be systematically

integrated into the twelve-tone series technique through the development of a conceptual “tone zodiac” model. This model allows the relationship between astrological structures and serialist transformations to be translated into a coherent organization of pitch and compositional structure. The results of the implementation show that the movement patterns of the sun and moon on the ecliptic plane can be used as the basis for determining motion, serial transformations, and the distribution of musical material within a composition. This research offers a new approach to the creation of serialist music that integrates symbolic, mathematical, and musical aspects. Furthermore, this method has the potential to be further developed across various ensemble formats, musical genres, and compositional approaches.

AUTHOR CONTRIBUTION

The roles of each author are as follows.

- Author 1 determined the research topic and conducted the research.
- Author 2 and 3 provided direction and guidance on the content of the scientific paper and technical issues related to scientific writing.

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DECLARATIONS

Use of Artificial Intelligence (AI) in Manuscript Preparation

The author hereby declares and affirms that:

- No generative AI tools were used in the development, analysis, or writing of this manuscript.
- The generative AI tool DeepL was employed exclusively for the purpose of language editing and grammatical refinement. Its use did not contribute to or influence the scientific content. The conception of the study, research design, data collection, analysis, interpretation, and formulation of results and conclusions are purely the result of the author's own intellectual capabilities.

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