

5 Bagatelle for String Quartet by Golden Ratio Harmony

Masao Yokoyama, 2019

Premiere: Tama Music Festival 2020 in Tokyo by Green Room Players

Notation for performance

In this string quartet, the pitches of tuning calculated by Golden Ratio are used. It produces the special harmony which we cannot listen to in a music tuned in normal tuning. The notes in this piece are written by natural harmonics and open strings. The 5 short pieces in this music have different character each other. Golden ratio is a special number, 1.618 (approximately 5 of 8th), which appears often in nature, geometry, art, architecture and other areas. The tuning pitches of each strings by the golden ratio based on A 440 Hz are selected as follows,

1st Violin I : 705.5Hz (near F), II: 441.9 Hz(A), III: 298.8 Hz (near D), IV: 214.5 Hz(between G#-A)

2nd Violin I : 615.7Hz (near D#), II: 441.9 Hz(A), III: 260.8 Hz (near C), IV: 181.7 Hz(near F#)

Viola I : 441.9Hz (A), II: 298.8 Hz(near D), III: 208.2 Hz (near G#), IV: 122.9 Hz(near H)

Cello I : 220.9Hz (A), II: 153.9 Hz(near D#), III: 90.8 Hz (near F#), IV: 63.3 Hz(between H-C)

Players tune strings in these pitches using the tuner application software in mobile phone which can display the pitch (e.g. gGstrings, Tuner T1 etc). The notes of open and natural harmonics in this piece are shown as below.

The image displays musical notation for the first four pieces of a string quartet, arranged in a 4x2 grid. The left column contains the notation for the 1st Violin, Viola, and Cello, while the right column contains the notation for the 2nd Violin. Each piece is represented by a single staff with a treble or bass clef, depending on the instrument. The notation includes natural harmonics (indicated by a '0' on the staff) and open strings (indicated by a '1' on the staff). The pieces are labeled I, II, III, and IV, corresponding to the tuning pitches listed in the text above. The notation is written in a standard musical notation style, with notes, rests, and accidentals.







1st Violin

2nd Violin

Viola

Cello

The special notes in this work are following,

-  : I, II, III, IV denote string number, (i.g. III is D string in violin)
Put finger on written note and play natural harmonics,
-  : swing bowing, with a little pressure and a little fast,
-  : bowing speed from slow to fast and crescendo,
-  : bowing speed from fast to slow and decrescendo,
- vib. or vibrato : vibrato on harmonics note,
-  : play fast as possible,
-  : short fermata with breath.