

## Challenging the Standard 24 Equal Quarter Tones Theory in Arab Music: A Case Study of Tetrachords Bayyātī and Ḥijāz

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**Abstract :** Arab music maqām (Arab modal framework) is founded, among other main characteristics, on microtonal intervals. Notwithstanding the importance and multifaceted nature of intonation in Arab music, there is a paucity of studies examining this subject based on scientific and quantitative approaches. The present-day theory concerning the Arab tone system is largely based on the pioneering treatise of Mikhā'il Mashāqah (1840), which proposes the theoretical division of the octave into 24 equal quarter tones. This kind of equal-tempered division is incompatible with the performance practice of Arab music, as many professional Arab musicians conceptualize additional pitches beyond the standard 24 notes per octave. In this paper, we refute the standard theory presenting the scale of well-tempered quarter tones by implementing a quantitative analysis of the performed intonation of two prominent tetrachords in Arab music, namely bayyātī and ḥijāz. This analysis was conducted with the help of advanced computer programs, such as Sonic Visualiser and Tony, by which we were able to obtain precise frequency data (Hz) of each tone every 0.01 second. As a result, the value (in cents) of all three intervals of each tetrachord was measured and accordingly compared to the theoretical intervals. As a result, a specific distribution of a range of deviation from the equal-tempered division of the octave was detected, especially the detection of a diminished first interval of bayyātī and diminished second interval of ḥijāz. These types of intonation entail a considerable amount of flexibility, mainly influenced by surrounding tones, direction and function of the measured tone, ornaments, text, personal style of the performer and interaction with the audience. This paper seeks to contribute to the existing literature dealing with intonation in Arab music, as it is a vital part of the performance practice of this musical tradition. In addition, the insights offered by this paper and its novel methodology might also contribute to the broadening of the existing pedagogic methods used to teach Arab music.

**Keywords :** Arab music, intonation, performance practice, music theory, oral music, octave division, tetrachords, music of the middle east, music history, musical intervals

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