Unveiling the "Mysterious" Notes in Chinese *Qinqiang* Opera Through Computational Methods

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Abstract. This paper investigates three microtonally ambiguous "mysterious" notes within the traditional Chinese *qinqiang* opera, long debated in scholarly literature. Drawing on a corpus of 18 audio clips from 9 archival recordings spanning over three decades (1991–2023), we apply the pyAMPACT toolkit—to perform note-level audio analysis and estimate precise pitch and onset data. Our findings challenge prior characterizations of these notes as microtonal inflections. Two scales, the florid tone scale and the bitter tone scale, are used in *qinqiang* opera. The florid tone scale exhibits controversy regarding the tuning of scale degrees 4 and 7, while the bitter tone scale presents conflicting claims concerning the tuning of scale degrees 3, 4, and 7. Through computational analysis, we determined that scale degrees 4 and 7 in the florid tone scale, as well as scale degrees 3 and 4 in the bitter tone scale, demonstrate no consistent deviations from equal temperament. However, scale degree 7 in the bitter tone scale consistently appears a semitone lower. These results suggest a historical shift from traditional microtonal practice toward standardized diatonic intonation over the past 34 years. The paper offers a revised interpretation of the florid and bitter tone scales and demonstrates how computational methods can support musicological inquiry in non-Western traditions.

We prefer to present orally.

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