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Sound-induced Interfacial Dynamics in a Microfluidic Two-phase Flow SZE YI MAK, HO CHEUNG SHUM, The Univ of Hong Kong — Retrieving sound wave by a fluidic means is challenging due to the difficulty in visualizing the very minute sound-induced fluid motion. This work studies the interfacial response of multiphase systems towards fluctuation in the flow. We demonstrate a direct visualization of music in the form of ripples at a microfluidic aqueous-aqueous interface with an ultra-low interfacial tension. The interface shows a passive response to sound of different frequencies with sufficiently precise time resolution, enabling the recording of musical notes and even subsequent reconstruction with high fidelity. This suggests that sensing and transmitting vibrations as tiny as those induced by sound could be realized in low interfacial tension systems. The robust control of the interfacial dynamics could be adopted for droplet and complex-fiber generation.

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