Physics > Fluid Dynamics

Tibetan Singing Bowls

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We present the results of an experimental investigation of the acoustics and fluid dynamics of Tibetan singing bowls. Their acoustic behavior is rationalized in terms of the related dynamics of standing bells and wine glasses. Striking or rubbing a fluid-filled bowl excites wall vibrations, and concomitant waves at the fluid surface. Acoustic excitation of the bowl's natural vibrational modes allows for a controlled study in which the evolution of the surface waves with increasing forcing amplitude is detailed. Particular attention is given to rationalizing the observed criteria for the onset of edge-induced Faraday waves and droplet generation via surface fracture. Our study indicates that drops may be levitated on the fluid surface, induced to bounce on or skip across the vibrating fluid surface.

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