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Vibrational instabilities of bound aggregates of bouncing droplets[1] MILES COUCHMAN, JOHN BUSH, Massachusetts Institute of Technology — Millimetric droplets bouncing on the surface of a vibrating fluid bath may interact through a shared wavefield to form a variety of quantized bound states. We present the results of a combined experimental and theoretical investigation investigating the rich variety of instabilities that may arise in droplet pairs, rings, and lattices as the baths vibrational acceleration is increased progressively. Particular attention is given to a linear stability analysis of two-dimensional Bravais lattices of bouncing droplets that allows us to discern the most unstable wave mode as a function of the initial lattice geometry and inter-drop spacing. Connections with collective vibrations in solid-state crystalline lattices are discussed.

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