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Resonance, Instability and Dynamical Stabilization in Bouncing Droplet Chains[1] LAUREN BARNES, New Jersey Institute of Technology, GIUSEPPE PUCCI, Universit de Rennes, ANAND U. OZA, New Jersey Institute of Technology — The bouncing droplet system has attracted recent interest because it exhibits behaviors similar to those previously observed only in the microscopic quantum realm. We present the results of a theoretical investigation of one-dimensional chains of bouncing droplets, with particular attention to the case in which the drop at one end of the chain is oscillated periodically. We demonstrate the existence of resonant forcing frequencies, and our predictions based on linear theory compare favorably with numerical simulations. We also demonstrate a dynamical stabilization of the chain into a new bouncing state for sufficiently high forcing frequencies. Our results highlight the role of temporally nonlocal interactions in the dynamics of this unique system.

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