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Oscillations of a liquid bridge resulting from the coalescence of two droplets VERONIQUE CHIREUX, DAVID FABRE, FREDERIC RISSO, PHILIPPE TORDJEMAN, SEBASTIEN CAZIN, Institut de Mecanique des Fluides de Toulouse, Universite de Toulouse, CNRS, IMFT-GROUPE INTERFACES TEAM — We study the inertial oscillations of a bridge of liquid maintained between two disks, both experimentally and theoretically. In the experiment, the bridge is formed by the coalescence of two droplets. After coalescence, the bridge performs weakly damped oscillations until it reaches its equilibrium shape. Four modes of oscillations can be extracted from digital processing of images recorded by means of a high-speed camera. Their frequency and damping rate have been determined and found to be independent of the initial conditions. Concurrently, the eigen modes of oscillations of a non-cylindrical bridge have been computed by assuming inviscid flow and small amplitude oscillations, and their characteristics turn out to be significantly different from that of a cylindrical bridge. The agreement between theoretical and measured frequencies confirms that the experimental modes correspond to the eigenmodes of the linear inviscid theory.

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