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Computational analysis of coalescence and breakup between a capillary switch and a pendant drop SANTHOSH RAMALINGAM, OSMAN BASARAN, Purdue University, CARLOS LOPEZ, Universidad Politecnica de Madrid, INES MARTINOVIC, AMIR HIRSA, Rensselaer Polytechnic Institute — Although capillary switches come in a variety of configurations, one that has been receiving much attention recently consists of a continuous volume of liquid in which two drops are joined through a liquid-filled circular orifice in a plate. Recent research has focused on the bi-stable nature of such capillary switches and their potential application as optical MEMS devices. Here, we investigate the dynamics of coalescence and break-up between a capillary switch and a pendant drop hanging from a moving rod wherein the capillary switch and the pendant drop consist of the identical incompressible, Newtonian liquid. The dynamics are analyzed both using a fast, one-dimensional (1D) algorithm and also rigorously using a fully three-dimensional but axisymmetric, i.e. two-dimensional (2D), algorithm. The effects of surface tension, inertial, viscous, and gravitational forces on the dynamics of coalescence and break-up *and* the subsequent steady-state shapes of the capillary switch and the pendant drop are investigated. Regions of the parameter space where the 1D algorithm is reliable are also identified.

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