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Motion and deformation of droplets through circular tubes HERVE GRANDJEAN, Universite Pierre et Marie Curie, ANNE-VIRGINIE SALSAC, GAETANO BURRIESCI, University College London, STEPHANE ZALESKI, Universite Pierre et Marie Curie — The motion and deformation of a droplet immersed in an immiscible fluid and flowing through a circular tube of comparable diameter is investigated. A parametric study is performed experimentally, varying the drop volume and capillary number. When increasing the parameters, the drop evolves from a circular shape to a more elongated one. A first transition occurs as the rear curvature of the drop inverses. When increasing further the parameters, the rear inwards curvature evolves into a cavity, an annular liquid sheet being formed at the back of the drop. A second transition takes place at a critical set of parameters, above which the drop no longer reaches a steady-state configuration. The annular sheet lengthens over time until break-up occurs. A numerical simulation has been conducted using the volume-of-fluid method. A comparison of the numerical results with the experimental observations will be given.

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