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On the minimum size of drops composing the type of monodisperse microemulsions obtained via tip streaming JOSE MANUEL GORDILLO, Universidad de Sevilla, ALEJANDRO SEVILLA, Universidad Carlos III, ELENA CASTRO-HERNANDEZ, Universidad de Sevilla — On a recent paper, Castro et al (JFM (2012), 698, 423-445, JFM12) reported the generation of concentrated monodisperse emulsions composed of drops with sizes even below 1 μm. Drops are generated from the capillary breakup of a long and thin ligament which strongly stretches downstream from the exit of an injector of radius R_i. The ligament is formed when a flow rate Q_i of a fluid with a viscosity μ_i discharges into an immiscible liquid of viscosity μ_o flowing in parallel with the axis of the injector at a velocity qU_0, with $q = Q_i/(\pi R_i^2 U_o)$. It was theoretically found that the diameter of the drops obtained is $D_i \propto R_i q^{1/2}$. However, experiments showed that the predicted drop size is only found when the highly stretched ligament is formed. But this occurs for values of $\lambda = \mu_i/\mu_o$ and the capillary number $Ca_o = \mu_o U_o/\sigma$, with σ the interfacial tension coefficient, above a certain threshold which depends on the flow rate ratio q. In this presentation we theoretically show that the boundaries in the (Ca_o,λ,q) space in which highly stretched long ligaments are formed, corresponds to the conditions under which the jet, calculated using the slender-body description of JFM12, is *globally stable*.

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