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Breakup of liquid filaments over a wide range of Ohnesorge number[1] ALFONSO A. CASTREJON-PITA, JOSE R. CASTREJON-PITA, IAN M. HUTCHINGS, University of Cambridge — This work presents a study of the breakup of liquid filaments over a wide range of Ohnesorge numbers (0.001 to 10) using a simple large-scale jet generator. The experimental arrangement features a variable-size nozzle, whose radius can be adjusted from 100 μm to 3 mm and which is capable of jetting liquids with viscosities between 1 mPa s and 1.4 Pa s. The actuator of this generator consists of an electromagnetic vibrator that can be driven by arbitrary waveforms in order to control the jet formation process. The instrumentation also includes a fast pressure transducer to monitor the true pressure drive produced by the actuator. The filament breakup behavior and distribution (regime diagram), in terms of aspect ratio and Ohnesorge number, is compared with the predictions from previously published models.

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