Abstract Submitted for the DFD20 Meeting of The American Physical Society

Experimental study of capillary jets of viscoelastic liquids LOUISE COTTIER, CORIA-UMR 6614 INSA ROUEN Normandie, CHRISTOPHE DUMOUCHEL, CORIA-UMR 6614 CNRS, MARIE-CHARLOTTE RENOULT, CORIA-UMR 6614 INSA ROUEN Normandie, CORIA ATOMIZATION AND SPRAYS TEAM — The development of capillary instability on low-velocity jets manifest itself by surface deformations, whose evolution depends on the injection conditions, namely the nozzle geometry, the injection velocity and the liquid properties. When the liquid is viscoelastic, some of its properties depend on the other injection conditions. Also, under some conditions, the jet exhibit structures called "beads-on-a-string" that might be subject to coalescence phenomenon. Statistical analyses of experimental data are conducted to study the dynamics of free lowvelocity viscoelastic liquid jets. The data set is made up of jet images taken at successive positions downstream from the nozzle exit. The images have been treated to detect the liquid/gas interfaces. The main features of these interfaces are captured by carrying two different Proper Orthogonal Decompositions (POD) within each ROI. The one considers each pixel value of the raster images, and the other is carried on the measured volume-based scale distributions. The variation of the injection conditions brings important results about their impacts on the onset of the capillary instability, on its evolution and also on the coalescence and degradation mechanisms.

> Cottier Louise CORIA-UMR 6614 INSA ROUEN Normandie

Date submitted: 07 Aug 2020

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