

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

In-flight surface tension and viscosity measurements of inkjet printed droplets HENDRIK STAAT, University of Twente, ARJAN VAN DER BOS, MARC VAN DEN BERG, HANS REINTEN, HERMAN WIJSHOFF, Océ Technologies B.V., MICHEL VERSLUIS, DETLEF LOHSE, University of Twente — In modern drop-on-demand inkjet printing, the jetted liquid is a mixture of solvents, pigments and surfactants. In order to predict the droplet formation process, it is of importance to know the liquid properties. Surface tension is not constant at the timescale of droplet formation for a liquid that contains surfactants, making it non-trivial to determine the surface tension of the ink directly. Therefore we developed a technique to measure the surface tension of liquids during inkjet printing. We use high speed imaging to record the shape oscillation of a microdroplet within the first few hundred microseconds after droplet pinch-off. The frequency of oscillation depends on the surface tension, so by determining this frequency, we can measure the surface tension. The decay of oscillation amplitude is set by the viscosity, so we can also determine the viscosity with this technique. We use this technique to study the effect of surfactants on the surface tension of ink during the inkjet printing process.

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Date submitted: 30 Jul 2015

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