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Effect of surfactants on jet break-up and drop formation in inkjet printing[1] EVANGELIA ANTONOPOULOU, OLIVER G. HARLEN, MARK A. WALKLEY, NIKIL KAPUR, University of Leeds — A key challenge in developing new applications of inkjet technology is to produce inks that can be jetted to form individual droplets and to transport functional components needed for the application. The development of mathematical models that allow fluid jetting behaviour to be determined as a function of fluid properties would allow optimisation to be carried out in-silico before creating the inks and verifying the performance. Surfactants are often added to aqueous inks in order to modify the surface tension. However, the rapid expansion of the free surface during the fast jetting process means local areas of the surface will be depleted of surfactants leading to surface tension gradients. Using high speed video we will compare the jetting behaviour of fluids with and without surfactants in an industrial inkjet print-head. We also present numerical simulation of inkjet break-up and drop formation in the presence of surfactants investigating more closely both the surfactant transport on the interface and the influence of Marangoni forces on break-up dynamics.

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