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**Muhammad Hameed\*** (mhameed@uscupstate.edu), Department of Mathematics, USC UPSTATE, 800 University Way, Spartanburg, SC 29316. *Long-wave asymptotic model for deformation and breakup of a fluid thread.*

The influence of surfactant on the breakup of a periodic fluid thread of low viscosity immersed in highly viscous exterior fluid at low Reynolds number is studied. With an aim to better understand the pinch-off dynamics, we use long-wave asymptotic, numerical simulations and experimental studies to investigate the effect of surfactant on the necking and breakup. Evolution equations for the jet interface and surfactant concentration are derived using long wavelength approximations. These one dimensional partial differential equations are solved numerically for given initial interface and surfactant concentration. It is found that the presence of surfactant at the interface retards the pinch-off process. The influence of various physical effects on the breakup process is also investigated. The influence of surface diffusion of surfactant on the thread deformation is studied by varying surface Peclet number. It is found that greater diffusion of surfactant causes the jet to pinch faster. (Received September 18, 2017)