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Repeated formation of fluid threads in breakup of a surfactant-covered jet PATRICK MCGOUGH, OSMAN BASARAN, School of Chemical Engineering, Purdue University, West Lafayette, IN 47907, USA — Breakup of thin threads is observed when fluid drips from leaky faucets, drops are emitted from inkjet printers, and miniscule nuclei and mammoth stars fission. As a surfactant-covered liquid jet approaches breakup, its profile consists of a periodic pattern of large drops connected by thin threads. Near the locations where the threads join the drops, simulations show that a series of thinner threads arise naturally as the jet pinches off. That threads can continue to form repeatedly without addition of noise when surfactants are present is unexpected and stands in direct contrast to earlier studies of surfactant-free systems. The thinning dynamics of successive threads are shown to be self-similar and approach Eggers's universal solution for clean interfaces as they become depleted of surfactant.

Osman Basaran
School of Chemical Engineering, Purdue University, West Lafayette, IN 47907

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