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Direct numerical simulation of three-dimensional liquid jet breakup[1] RICARDO CONSTANTE, LYES KAHOUADJI, Imperial College London, ANDRE NICOLLE, BP, JALEL CHERGUI, DAMIR JURIC, LIMSI, CNRS, SEUNGWON SHIN, Hongik University, Korea, OMAR K. MATAR, Imperial College London — We carry out direct numerical simulations of liquid jet dynamics and breakup using a high-performance code, *Blue*, which uses a hybrid technique based on the front-tracking and the level-set method; it defines the interface position through a marker function and a local triangular Lagrangian mesh. Liquid jet breakup is an example of interfacial complexity associated with multiphase flows because of the formation of ligaments and their pinch off to give rise to droplet formation. We consider the atomisation of a liquid jet released into a stagnant gas phase where the velocity is stimulated sinusoidally to promote the growth of Kelvin-Helmholtz instabilities, thus forming a flow system characterized by complex interfaces. The spread of cylindrical liquid jet into a coflowing external stream is also considered (essentially, a replication of the Marmottant and Villermaux experimental work).

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