

Abstract Submitted  
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**Three-dimensional numerical simulations of falling films using an adaptive unstructured mesh**<sup>1</sup> CHRIS PAIN, ZHIHUA XIE, OMAR MATAR, Imperial College London — Falling liquid films have rich wave dynamics, often occurring in many industrial applications, such as condensers, evaporators and chemical reactors. A number of numerical studies featuring falling liquid films are available in the literature; the majority of them, however, have focused on two-dimensional falling films. Far fewer studies have considered three-dimensional falling films, and those that have only studied the flow in a periodic domain. The objective of this study is to investigate flow dynamics of developing three-dimensional falling films using the Navier-Stokes equations coupled with interface capturing approach over extended domains. An adaptive, unstructured mesh modelling framework is employed here to study this problem, which can modify and adapt three-dimensional meshes to better represent the underlying physics of multiphase problems and reduce computational effort without sacrificing accuracy. Numerical examples of three-dimensional falling films in a long domain are presented and discussed.

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