

Abstract Submitted  
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**Effect of Marangoni stresses on the three-dimensional wave dynamics of surfactant-covered falling liquid films**<sup>1</sup> ASSEN BATCHVAROV, LYES KAHOUADJI, CRISTIAN RICARDO CONSTANTE AMORES, GABRIEL FARAH NORES GONALVES, Imperial College London, SEUNGWON SHIN, Hongik University, JALEL CHERGUI, DAMIR JURIC, Laboratoire d'Informatique pour la Mécanique et les Sciences de l'Ingénieur (LIMSI), RICHARD V. CRASTER, OMAR K. MATAR, Imperial College London — The ubiquity of falling films in industrial processes and daily applications has inspired the scientific community for decades, producing a number of crucial reviews in recent years. In the context of falling film flows, surfactants reduce surface tension, additionally introducing variations of this quantity that give rise to Marangoni stresses, which have a flow stabilizing effect. In recent years, the effect of insoluble surfactants on falling films has been studied using stability theory. This work aims to study the effect of insoluble surfactants on the nonlinear dynamics of falling liquid films using fully three-dimensional numerical simulations. This study will present the effect of varying the surfactant Marangoni parameter on the emergent wave dynamics and critical vortical structures.

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Omar K. Matar  
Imperial College London

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