Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Three-dimensional direct numerical simulation of falling liquid films[1] JALEL CHERGUI, DAMIR JURIC, LIMSI, CNRS, France, SUENGWON SHIN, Honkgik University, Republic of korea, LYES KAHOUADJI, RICHARD CRASTER, OMAR MATAR, Imperial College London — The dynamics of a thin film falling down an inclined solid surface have attracted the attention of many researchers because of the richness and variety of waves which develop on its liquid-air interface. Besides experimental work, the problem has been widely studied in the literature but direct numerical simulations have been limited to two-dimensions or low-dimensional modeling for three-dimensional problems. We present a computational study of falling liquid films in a three-dimensional inclined rectangular domain (45°) using the massively parallel code BLUE for Lagrangian tracking of arbitrarily deformable phase interfaces. Calculations are carried out on O(10^3) cores in a large domain (24cm × 12cm × 1.5 cm) for Reynolds and Kapitza numbers of 100 and 10, respectively, in order to obtain several three-dimensional wave patterns and solitary waves.

[1]EPSRC UK Programme Grant MEMPHIS (EP/K003976/1)

Omar Matar
Imperial College London

Date submitted: 02 Aug 2016 Electronic form version 1.4