Abstract Submitted
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Parallelised direct numerical simulation of three-dimensional wavy falling films[1] DAMIR JURIC, JALEL CHERGUI, LIMSI-CNRS, LYES KAHOUADJI, OMAR MATAR, Imperial College London, SEUNGWON SHIN, Hongik University, Republic of Korea — We present a computational study of falling liquid films in a three-dimensional inclined rectangular domain using the new massively parallel code, BLUE. Calculations are carried out in order to obtain several wave patterns such as occasional solitary waves, which travel downstream at a constant velocity, or less coherent structures. BLUE uses parallelization algorithms based on MPI and algebraic domain decomposition. The velocity field is solved by a parallel GMRES method for the viscous terms and the pressure by a parallel multigrid method. The method for the treatment of the fluid interfaces and capillary forces uses a parallelized Front Tracking/Level Set technique which defines the interface both by a discontinuous density field as well as by a local triangular Lagrangian mesh. This structure allows the interface to undergo large deformations including the rupture and/or coalescence of fluid interfaces.

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