Non-linear dynamics of viscous bilayers subjected to an electric field: 3D phase field simulations[1] CHRISTOS DRITSELIS, GEORGE KARAPETSAS, VASILIS BONTOZOGLOU, University of Thessaly — The scope of this work is to investigate the non-linear dynamics of the electro-hydrodynamic instability of a bilayer of immiscible liquids. We consider the case of two viscous films which is separated from the top electrode by air. We assume that the liquids are perfect dielectrics and consider the case of both flat and patterned electrodes. We develop a computational model using the diffuse interface method and carry out 3D numerical simulations fully accounting for the flow and electric field in all phases. We perform a parametric study and investigate the influence of the electric properties of fluids, applied voltage and various geometrical characteristics of the mask.

George Karapetsas
University of Thessaly

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