

Abstract Submitted  
for the DFD12 Meeting of  
The American Physical Society

**Dynamics of interface separating two fluids under AC electric fields** ASGHAR ESMAEELI, Southern Illinois University Carbondale — Direct Numerical Simulations are performed to study dynamics of a horizontal interface separating two fluids under the influence of an AC electric field. A front tracking/finite difference scheme is used, in conjunction with Taylor's leaky dielectric model, to solve the governing electrohydrodynamics equations in both fluids. The interface becomes unstable beyond a critical voltage, going through a transition period, and forming an oscillatory vertical pillar that points from the liquid of higher electric conductivity to the one with a lower conductivity. It is shown that the pillar shape depends on the dielectric properties of the fluids. The correlation between the frequency of the interface oscillation and that of the imposed electric field is found and a parametric study is performed based on the governing nondimensional number of the problems.

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Date submitted: 03 Aug 2012

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