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**Electrohydrodynamic instability in microchannels:  
time dependent forcing** BRIAN STOREY, DAVID BOY, Olin Col-  
lege — The interaction of fluid electrical conductivity gradients and ap-  
plied electric fields are known to be susceptible to electrohydrodynamic  
instabilities. In microfluidic applications, it has been shown that such  
instabilities can generate chaotic flows at low Reynolds number. This  
work considers stability in a flow channel with an electric field applied  
perpendicular to a diffuse interface of two fluids with different electrical  
conductivities. The applied electric field, which drives the instability,  
is taken to have both AC and DC components. The time dependent  
nature of the electric body force can have a stabilizing or destabilizing  
effect relative to the DC case. The linearized analysis is validated with  
direct numerical simulations.

Prefer Oral Session  
 Prefer Poster Session

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