Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

The collapse of a bubble in an electric field STEPHEN J. SHAW, PETER SPELT, OMAR K. MATAR, Imperial College London — The collapse of a bubble in an electric field at low Mach numbers is examined. A modified Rayleigh-Plesset equation is derived along with another equation for the ellipsoidal shape deformations which are assumed to be small. Numerical integration of these equations indicate that a bubble can be made to collapse by instantaneously switching on an electric field. Non-harmonic volumetric oscillations are also observed for time-dependent electric fields of sufficiently large amplitude. We also show that the rate of bubble collapse driven by external pressure variations due, for instance, to acoustic forcing, can be accelerated.

Peter Spelt
Imperial College London

Date submitted: 31 Jul 2006 Electronic form version 1.4