

Analysis of a free boundary problem modeling 3D MEMS

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An idealized electrostatic microelectromechanical system (MEMS) consists of a rigid ground plate above which a thin elastic plate is suspended. The elastic plate is assumed to be hinged on its boundary. Applying a voltage difference between the two plates induces a Coulomb force that deforms the elastic plate. The corresponding mathematical model couples a fourth-order parabolic equation for the vertical deformation of the elastic plate to the harmonic electrostatic potential in the free domain between the two plates.

In this talk, I will present some recent results on local and global well-posedness of the model as well as on existence and non-existence of stationary solutions.