MEMS AND MICRODEVICE MODELLING

PART 1: MODEL REDUCTION

Description

To create low-order dynamic macromodels that permit fast simulation while capturing most of the accuracy and flexibility of the full model.

Technique developed

Karhunen-Loève decomposition and the Galerkin procedure that employs the eigenfunctions extracted from the Karhunen-Loève decomposition to reduce original nonlinear dynamic systems with infinite degree of freedom to finite dimensional models.

Example

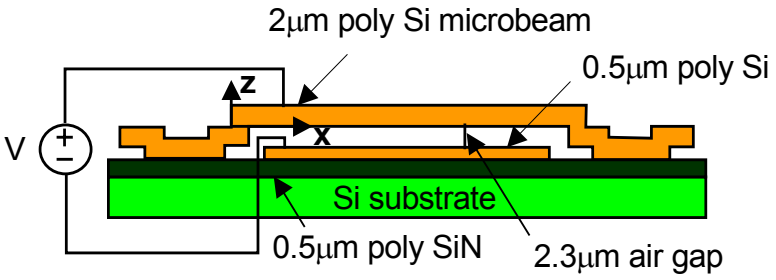

Figure 1. A MEMS device modeled as doubly-clamped beam

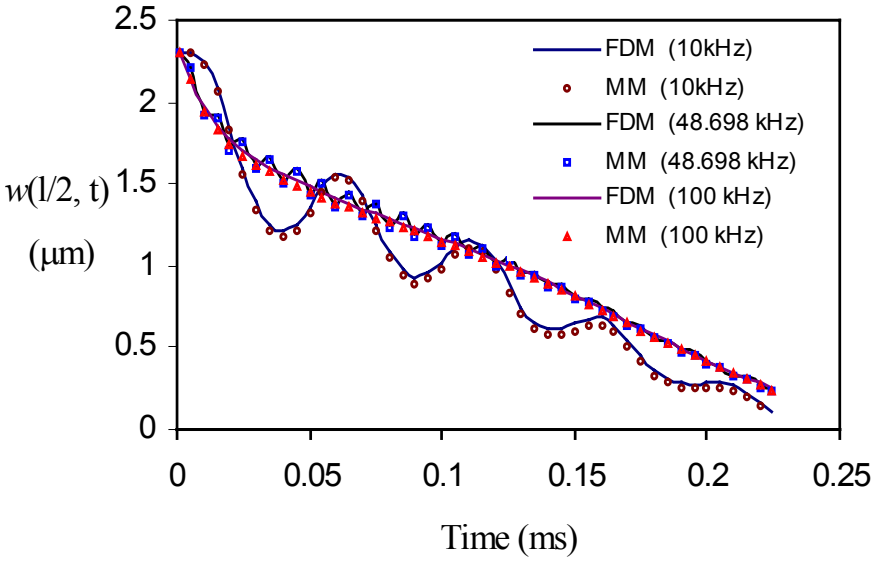

Figure 2. Simulation of pull-in dynamics for a set of sinusoidal input voltage with full model and macromodel