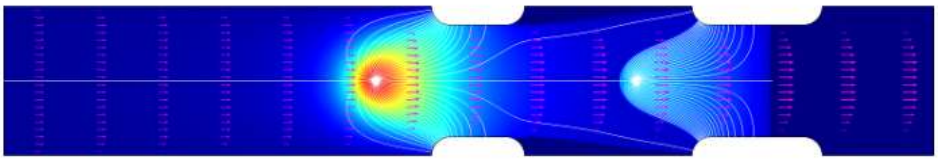
ELECTRICAL ENGINEERING
UNIVERSITY of WASHINGTON

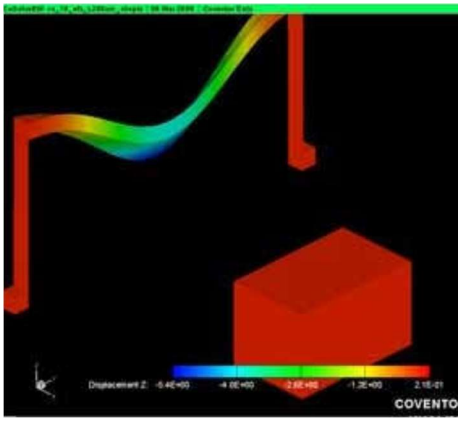
AUTUMN QUARTER – 2017

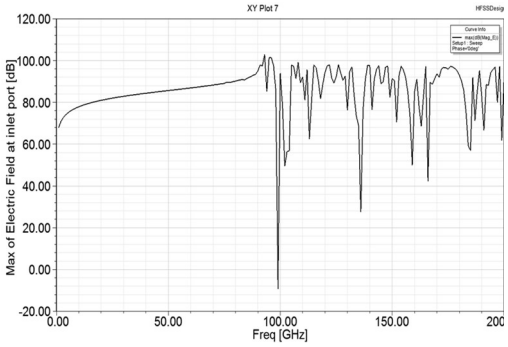
EE 503 PMP: MODELING OF MEMS

Prof. Alexander Mamishev

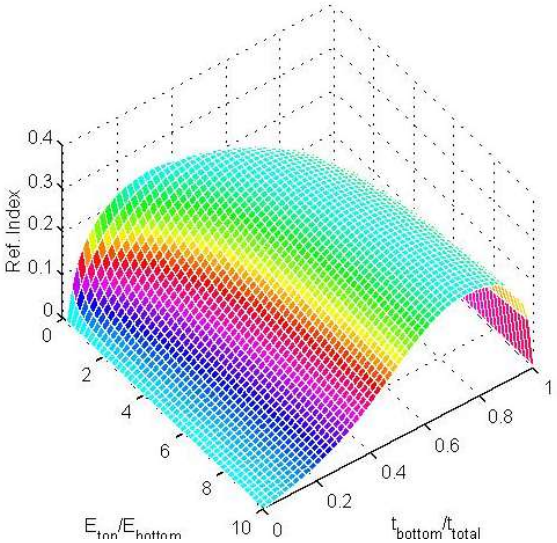
Course Overview







EE 503 PMP, Modeling of Micro-Electro-Mechanical Systems (MEMS), is a 4-credit graduate level course, should be of value to those working in industry, academia, and IP protection. The course focuses on modeling of sensors, actuators, and microfluidic systems, with the emphasis on electromechanical dynamics, micro-optics, and heat transfer. After a review of medical, aerospace, and consumer device applications, students will focus on the course project in the area of their interest (not limited to these review topics).



The course will introduce students to numerical and analytical modeling and design of microsystems using leading software in the field. Two software packages, COMSOL and Ansys Maxwell will be in a dedicated computer lab to simulate electrostatic, magnetostatic, mechanical, electromechanical, thermal, piezoelectric, and fluidic phenomena.

Lecture material also includes MEMS design philosophy, lumped modeling, conjugate power variables, equivalent circuits for linear transducers, linear system dynamics, design optimization, parametric analysis, and patterns of patentable designs.

Textbook: Stephen Senturia, Microsystem Design.

Grading: Grades will be based on homework assignments, midterm, and a final project. Homework: 50%, Midterm: 20%, Final Project: 30%.

Instruction time: Mondays 6 pm to 9:50 pm, with both lectures and computer labs in most sessions to help keep the attention span.