

Simulations with COMSOL Multiphysics: from MEMS to Nanophysics

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Micro Electro-Mechanical Systems (MEMS) and nanostructured materials are the key of several cutting-edge technological applications. MEMS are widely used as actuators and sensors and their working principle is often based on the interaction between multiple physical effects. Additionally, the capability to grow nanostructured materials offers extra possibilities, such as the exploitation of special materials (e.g. graphene) or specific effects (e.g. plasmonic behaviors). COMSOL allows the characterization of these and many others effects that are essential for the study of micro- and nano-sized objects. During this presentation, we will discuss in particular:

- * single-physics effects such as mechanical deformation, electromagnetics and transport phenomena in MEMS and NEMS;
- * multiphysics, which is the coupled solution of single-physics phenomena and one of the strengths of COMSOL;
- * the implementation of non-standard contributions, which allow to include effects that go beyond the typical terms of classical single physics
- * how COMSOL enables simulation experts to transform models into APPs, that can be easily shared with colleagues, partners and customers through COMSOL Server™.