Design and Simulation of MEMS-based Piezoelectric Accelerometer

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Abstract

The Micro electro mechanical systems (MEMS) technology provides us a platform to interface between mechanical and electrical components. In this paper, we have designed MEMS accelerometer based on piezoelectric property, and simulated using COMSOL Multiphysics®. The design, which has PZT kept in the annular diaphragm, provides good sensitivity. When this accelerometer is subjected to stress electrical signals are generated from the crystal linearly to the amount of stress applied. Similarly the simulation has been performed for the designed model for different materials, small variations in the geometry, and good results have been observed. These can be used in ASIC and RF telemetry system for wireless monitoring of industrial equipment.

Reference

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Figures used in the abstract

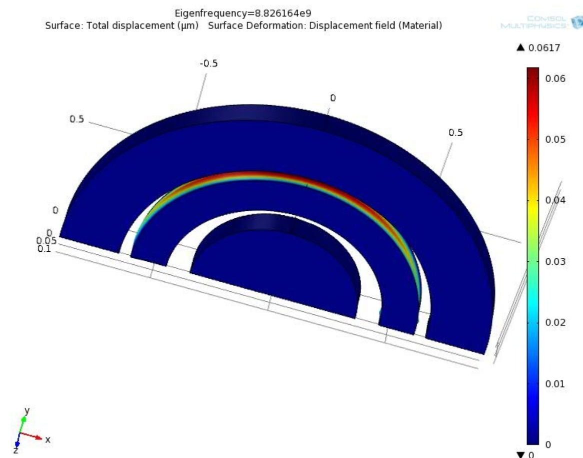

Figure 1: Computed result of designed accelerometer

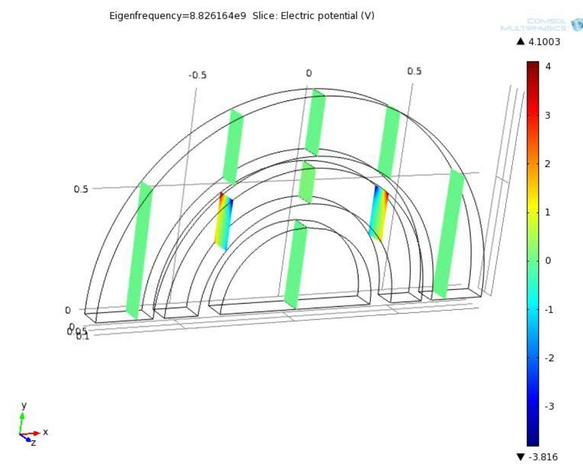

Figure 2: Potential obtained at the time of computation

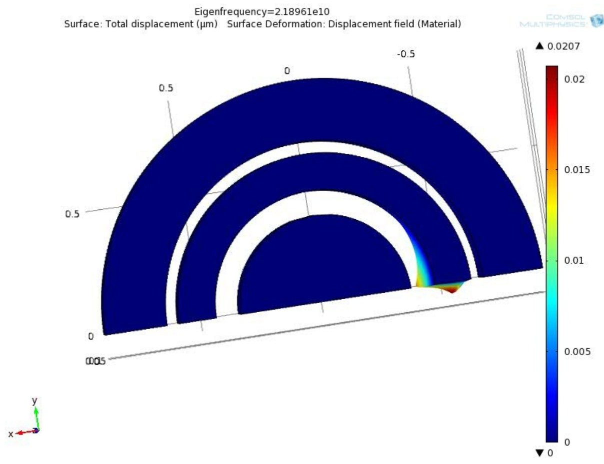

Figure 3: Computed result when simulated with quartz

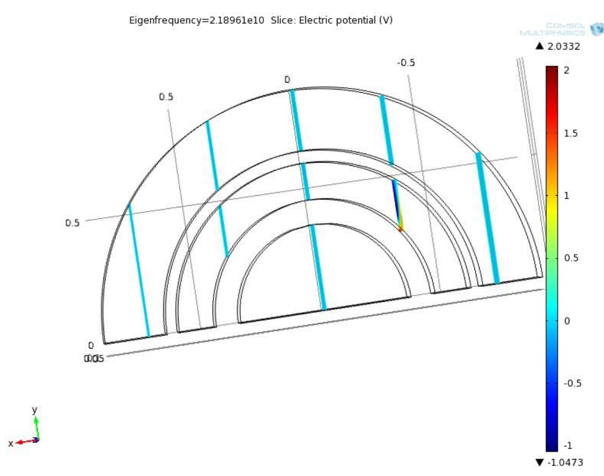

Figure 4: Potential obtained when simulated with quartz