Design and Simulation of Capacitive Pressure Sensor for Condition Monitoring

S. Sushma[1], R. Surekha[1], K. J. Rudhresha[1], S. Swathi [1], S. Singh[1], S. L. Pinjare[1]

[1]Dept. of ECE, Nitte Meenakshi Institute of Technology, Bangalore, Karnataka, India

Abstract

This paper focuses on the development of a capacitive pressure sensor for condition monitoring applications. One method to measure vibrations is to mount an pressure sensor on the vibrating machinery or object and measure the pressure exerted due to vibrations. Measured pressure level help us to detect any deviations from the normal conditions. The capacitive-based pressure sensor is employed to avoid temperature drift. In this work, comb drive pressure sensor structure is designed and simulated showing the deflection of the proof mass and generate the capacitance, which is proportional to the applied input pressure.

In this paper sensor is designed using COMSOL Mutiphysics® software using the Electromechanics and Pressure Acoustics physics interfaces.

Reference

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Figures used in the abstract

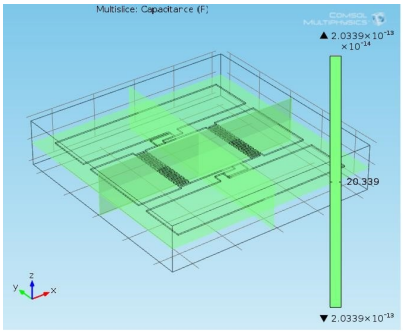

Figure 1: Capacitance.

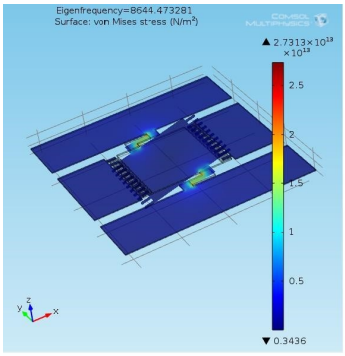

Figure 2: Frequency analysis mode1.

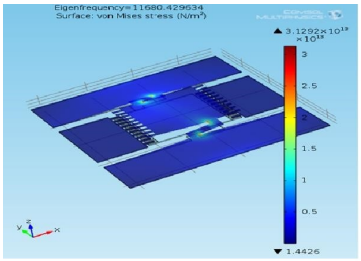

Figure 3: Frequency analysis mode2.

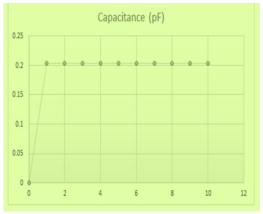

Figure 4: Capacitance vs pressure graph.