

## DESIGN AND OPTIMIZATION OF BULK MICROMACHINED ACCELEROMETER FOR SPACE APPLICATIONS

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Abstract - The accelerometers used for Inertial Navigation in satellite launch vehicles demand excellent performance in terms of sensitivity, noise immunity, linearity, bias and scale factor stability over time and environmental changes. Detailed and in-depth design of the microstructure by computer simulation is required to ensure structural integrity and reliability of the microstructure. The microstructure of the accelerometer consists of a proof mass suspended from the mounting frame by beam springs. Extensive Finite Element simulation of the silicon microstructure has been carried out to obtain application specific optimum design parameters. Based on the deflection, frequency and stress analyses the optimum geometry and dimensions of the accelerometer have been determined. Noise analysis has been carried out, the performance of the accelerometer has been predicted and its compliance to the expected performance is ensured.

Index terms : Microstructure, Microelectromechanical Systems, Accelerometer