

PARAMETRIC ANALYSIS FOR THE EFFECTS OF NATURAL FREQUENCY OF MEMS GYROSCOPE FOR AN AUTOMOTIVE APPLICATION

**V. USHA SHREE, P. CHANDRASEKHAR REDDY
& K. HEMA CHANDRA REDDY**

Abstract

This paper deals with developing a method to obtain the parametric analysis of a novel micromachined gyroscope analyzed as a 2-DOF rigid body system with damping. The parametric analysis gave information on how the natural frequency is affected when one of the parameter (here mass) is perturbed. The concept is implemented using MEMS (MicroElectroMechanicalSystem) technology. Two types of vibration will be investigated, free and forced. The MEMS Gyroscopes mass has two vibrations that are of interest for this paper, vertical (bounce) and pitch. Bounce is the translational component of vibrations of the sprung mass in the direction of the z-axis and pitch is the angular component of vibration of the sprung mass about the vehicle y-axis.

Keywords : 2-DOF, MEMS gyroscope, parametric analysis, bounce and pitch.