

**A NOVEL STRUCTURAL DESIGN FOR IMPROVING THE SENSITIVITY OF
A SURFACE-MICROMACHINED VIBRATORY GYROSCOPE**

Abstract

The present invention is a motion sensor apparatus for use as a general mechanical amplifier, a gyroscope, or other resonant sensor such as an accelerometer. In accordance with the invention, the motion sensor apparatus includes a primary mass and a primary flexure structure. The primary flexure structure supports the primary mass to experience driven motion against a bias of the primary flexure structure. The apparatus further includes a secondary mass which is less massive than the primary mass. A secondary flexure structure interconnects the secondary mass with the primary mass, and supports the secondary mass to experience sensing motion relative to the primary mass against a bias of the secondary flexure structure. The stiffness ratio between the primary and secondary flexure structures is equal to the mass ratio between the primary and secondary masses.

(Fig. 2)