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خلاصه مقاله:

In the present paper, the dynamical snap-through of a preloaded micro-sensor is analyzed. This behavior is linked to analyzingbifurcation behavior of the micro structure in a suitable framework. Effects of the axial pre-stress and the excitation amplitude on thestability and sensitivity of the sensor are also discussed. In order to capture the size effects, the modified strain gradient theory isemployed on an Euler-Bernoulli beam. Applying the Hamilton's principle and utilizing the Galerkin's method, the nonlineargoverning equation for the vibration is obtained. The method of multiple scales (MMS) is then used to obtain the frequency-responseequation and by using a mathematical approach, the bifurcation points and the jump heights of the micro-resonator are analyzed. Thecalculated analytic equation for frequency response, provides the conditions for obtaining the range of snap-through and studying theeffects of different designing parameters on the multivaluedness range. The jump height of the micro-resonator is proposed to use asa criterion for sensing purposes. The simulations are illustrated and the results are verified with similar works

کلمات کلیدی:

MEMS، Bifurcation، Modified Strain Gradient، Stability، Nonlinear Vibration

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