

عنوان مقاله:

Scale-Dependent Dynamic Behavior of Nanowire-Based Sensor in Accelerating Field

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خلاصه مقاله:

The accelerating fields (e. g. centrifugal acceleration and constant acceleration) can change the physical performance of nano-sensors significantly. Herein, a new size-dependent model is developed to investigate the scale-dependent dynamic behavior of nanowire-fabricated sensor operated in an accelerating field. The scale-dependent equation of motion is developed by employing a consolidation of the strain gradient elasticity (SGE) and the Gurtin–Murdoch theory (GMT). A semi-analytical solution is extracted for calculating the stability parameters. Effects of different phenomena including centrifugal force, microstructure dependency, surface layer, length-scale-parameter, dispersion forces, squeezed film damping on the dynamic stability parameters are demonstrated.

کلمات کلیدی:

Nanowire, Accelerating field, Strain gradient elasticity, Dynamic instability, Surface energies

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