عنوان مقاله:

A Brief Review on the Asymptotic Methods for the Periodic Behaviour of Microelectromechanical Systems

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خلاصه مقاله:

Microelectromechanical systems (MEMS) is a very vast field and has been identified as lots of potential in tiny instruments. Because of their unique and exciting properties such as small sizes, low power consumption, reliability, and their capability of batch fabrications, their role in the production of microstructures has gained much importance for researchers and industries. The following study includes an overview of current asymptotic approaches and novel innovations which are applicable not only to weakly nonlinear equations but also to highly nonlinear equations derived from MEMS models. Moreover, the approximate analytical solutions obtained by these asymptotic approaches are valid across the whole solution domain. Various limitations of traditional perturbation method and variational iteration method are discussed and different modified versions of perturbation approaches and variational theory are provided to overcome these existing flaws. Two-scale idea for MEMS technology is also described. Some examples are given .to elucidate the effectiveness and convenience of these methodologies

کلمات کلیدی:

Asymptotic methods, Nonlinear oscillators, Microelectromechanical systems, Amplitude-frequency relationship, Two-scale vibration