

Static and Dynamic Analysis of Microcantilever Beam

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Abstract : The development of micro and nano particle is challenging task and the study of the behavior of material at the micro level is gaining importance as their behavior at micro/nano level is different. These micro particle are being used as a sensing element to measure and detects the hazardous chemical, gases, explosives and biological agents. In the present study, finite element method is used for static and dynamic analysis of simple and composite cantilever beams of different shapes. The present FE model is validated with available analytical results and various parameters like shape, materials properties, damped and undamped conditions are considered for the numerical study. The results show the effects of shape change on the natural frequency and as these are used with fluid for chemical applications, the effect of damping due to viscous nature of fluid are simulated by considering different damping coefficient effect on the dynamic behavior of cantilever beams. The obtained results show the effect of these parameters can be effectively utilized based on system requirements.

Keywords : micro, FEM, dynamic, cantilever beam

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