

ABSTRACT

In this work, parametric excitation effect to enhance sensitivity of a sensor is analyzed. The use of microcantilever as a sensor in AFM requires the ability to detect small forces considering the small size of the measured sample. The equation of motion of the microcantilever beam will be transformed into MATHIEU equation. Sensitivity of a sensor can be enhanced by parametric resonance and parametric amplification. The requirements for parametric resonance and parametric amplification to happen have a correlation with the stability of the system. Therefore, stability chart will be obtained from the MATHIEU equation and with the help of a MATLAB package specialized in continuation, more range of stability chart is obtained to find more possibilities of parametric resonance and amplification to happen.

Keywords: Sensitivity, parametric excitation, parametric resonance, stability chart.