International J. of Math. Sci. & Engg. Appls. (IJMSEA)
ISSN 0973-9424, Vol. 6 No. I (January, 2012), pp. 249-261

ON THE ANALYSIS OF AN OSCILLATOR WITH PERIODICALLY TIME-VARYING MASS AND FORCED VIBRATION

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Abstract

A forced vibration of a simple one degree of freedom system related to the dynamics of cables (such as stayed bridges, electricity, telephone) will be studied in this paper. Usually the stay cables have a smooth polyurethane mantle and a cross section which is nearly circular. Let the cylinder with ridge be able to oscillate, with small amplitude, around the axis such that the oscillations are excited by an external force. It will be studied in this paper a forced vibrations of an oscillator single degree of freedom with a time-varying mass. Small masses which periodically hitting and leaving to the oscillator with different velocity give a forced to the vibration. Because the small mass stay on the oscillator surface for some time then the effective mass of the oscillator will periodically vary in time. In this paper it will be studied all kind possibilities of the mass and the velocity of the masses which are hitting and leaving to the oscillator.

Key Words : *Flow induced vibrations, Time-varying mass, Forced vibration.*

2000 AMS Subject Classification : 34E10, 34D10.

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