DYNAMIC PROPERTIES OF PIECEWISE HOMOGENEOUS LAYERS RESTING ON ELASTIC SUBSTRATES: BAND-GAPS, LOCALIZED MODES AND EFFECT OF PRESTRESS

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Key Words: *Band-gaps, Periodic Structures, Prestressed Materials, Localized Modes.*

ABSTRACT

In the present communication, the long-wavelength dynamics of a hard layer resting on a soft substrate is investigated with the approximate model of a beam on an elastic foundation, as obtained by Bigoni et al. (2008) [1]. The aim is to analyze the effect of the prestress in the layer on the characteristic frequencies of the system when the layer has piecewise homogeneous properties, then adopting a Bloch-Floquet technique. It is shown how the pass-bands/band-gaps (ranges of admissible/forbidden frequencies) are shifted by tuning the prestress, a way that can be employed in the design of MEMS and in the mechanics of `flexible' electronics. Attenuated –localized- modes existing within the band gaps are also studied and the effects of defects distributed along the layer

REFERENCES

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