
Multimode approximations for thin elastic coatings and interfaces

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Abstract

Thin elastic coatings and interfaces arise in numerical engineering applications, including high contrast laminates involving soft layers. Forced time-harmonic motions are considered not making any restriction on the vibration frequency. Long wave, multimode approximations are derived from the original 3D setup. It is governed by 2D equations with coefficients depending on trigonometric functions of the frequency parameter. The related explicit dispersion relations appear to be of general interest as well. Although formulations are oriented to the analysis of the effect of prescribed stresses slowly varying along the faces, they are also useful of various resonance responses due to concentrated loading. Numerical comparisons between exact results and asymptotic predictions are demonstrated.

References

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