

Surface waves in a multi-layered elastic half-space

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Abstract: The study is focussed on surface waves on an isotropic elastic half-space coated with a thin multi-layer laminate induced by a prescribed vertical surface stress. The effective boundary conditions modelling a multi-layered coating are derived at the long-wave limit, generalising the effective boundary conditions for a thin single layer, see e.g. [1,2]. A singularly perturbed hyperbolic equation on the interface is then derived, extending the previous consideration in [3,4]. The effect of the perturbative pseudo-differential operator including the structure of the emerging quasi-front is analysed. Finally, some numerical illustrations of surface wave field are presented. 1. Tiersten, H. F. "Elastic surface waves guided by thin films." *Journal of Applied Physics* 40.2 (1969): 770-789. 2. Vinh, P.C., and Linh, N.T.K. "An approximate secular equation of Rayleigh waves propagating in an orthotropic elastic half-space coated by a thin orthotropic elastic layer." *Wave Motion* 49.7 (2012): 681-689. 3. Dai, H-H., Kaplunov, J., and Prikazchikov, D.A. "A long-wave model for the surface elastic wave in a coated half-space." *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences* 466.2122 (2010): 3097-3116. 4. Kaplunov, J., and Prikazchikov, D.A. "Asymptotic theory for Rayleigh and Rayleigh-type waves." *Advances in Applied Mechanics*. Vol. 50. Elsevier, 2017. 1-106.

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