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The wave and vibratory power transmission in a finite L-shaped Mindlin plate with two simply supported opposite edges

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Abstract In this paper, wave and vibratory power transmission in a finite L-shaped Mindlin plate with two simply supported opposite edges are investigated using the wave approach. The dynamic responses, active and reactive power flow in the finite plate are calculated by the Mindlin plate theory (MPT) and classic plate theory (CPT). To satisfy the boundary conditions and continuous conditions at the coupled junction of the finite L-shaped plate, the near-field and far-field waves are entirely contained in the wave approach. The in-plane longitudinal and shear waves are also considered. The results indicate that the vibratory power flow based on the MPT is different from that based on the CPT not only at high frequencies but also at low and medium frequencies. The influence of the plate thickness on the vibrational power flow is investigated. From the results it is seen that the shear and rotary inertia correction of the MPT can influence the active and reactive power at the junction of the L-shaped plate not only at high frequencies but also at low and medium frequencies. Furthermore, the effects of structural damping on the active and reactive power flow at the junction are also analyzed.

Keywords:

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