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Diffraction phenomena associated with a composite plate
containing an interior periodically corrugated interface

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The interest in the study and applications of phononic crystals has naturally lead to the investigation of other novel periodic structures. The present work examines the case of a plate constructed of two solid layers of differing elastic properties separated by a periodically corrugated interface. It is shown how the dispersion curves are influenced by the internal corrugated interface and how they evolve as a function of the magnitude of this corrugation. Internal diffraction effects alter the dispersion properties and thus have an important effect on the composite when it is used as an acoustic filter. These effects are also important for the transmission and reflection of sound when the composite is used as a panel or when it is the intention to generate Lamb waves to investigate the composite plate nondestructively.