Influence of Corrugation and Loosely Bonded Interface on the Propagation of Torsional Wave Propagation in a Viscoelastic Layer

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Abstract : The present paper calibrates the efficacy of corrugated and loosely bonded common interface of a viscoelastic layer and a dry sandy Gibson half-space on the propagation of torsional surface wave. Using suitable boundary conditions, the dispersion relation for the concerned problem is deduced in complex form. Numerical computation of the real part of the obtained dispersion relation gives the dispersion curve whereas the imaginary part bestows the damping curves. The use of Whittaker's function and Bessel's functions are among the major concerns of the paper. The investigation of the influence of the affecting parameters viz. heterogeneities, sandiness, Biot's gravity parameter, initial stresses, loosely bonded interface, corrugation and internal friction on the phase velocity as well as damped velocity of torsional wave, through numerical discussion and graphical illustration, is among the major highlights of the current study.