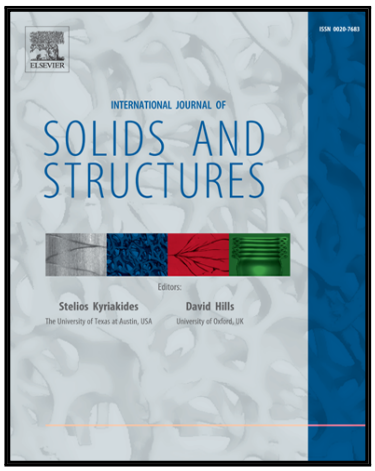

Universal analytical solution of the steady-state response of an infinite beam on a Pasternak elastic foundation under moving load

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Highlights

- Exact derivation by Fourier transform of a universal, explicit closed-form parametric analytical solution of the steady-state response of a uniform infinite Euler-Bernoulli elastic beam on a Pasternak elastic foundation subjected to a concentrated load moving at constant velocity.
- Rigorous mathematical procedure for classification of the parametric behavior of the solution, by varying the mechanical parameters of the beam-foundation system, based on the parametric nature of the Fourier transform poles.
- Different types of bending wave shapes are shown to propagate within the beam, including for new solution instances that may be obtained for given values of the physical parameters, such as for a high Pasternak modulus.
- Original re-derivation and reinterpretation of steady-state physical characteristics, such as critical velocity and two-branch critical damping.
- Highlighting of characteristic features of the physical steady-state response by a parametric analysis involving normalized deflection, cross-section rotation, bending moment and shear force.