SM13S_10745

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

Three-Dimensional Transmission in Plane Layered Elastic Composites

Kanmi Aderogba

Department of Mathematics, University of Lagos, Nigeria

Starting from a basic theorem which explicitly expresses the displacement induced in two perfectly bonded semi-infinite isotropic elastic solids in terms of the corresponding displacement induced in the homogeneous elastic whole space, whatever be the mechanism of loading, we derive in a stepwise fashion a well-structured series representation for the three-dimensional elastic field induced by an arbitrary singularity which is operative in or near a thick layer separating two other dissimilar semi-infinite isotropic elastic solids. The main objective is a physical interpretation of the seemingly complex solution in terms of fundamental singular fields. Several illustrative examples are given, including the image system produced by an arbitrary singularity in a slow steady viscous flow between two no-slip parallel plates.

View the extended summary