

TWO-DIMENSIONAL STATIC DEFORMATION OF AN ORTHOTROPIC ELASTIC LAYERED HALF-SPACE DUE TO BLIND STRIKE-SLIP FAULT

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ABSTRACT

Closed-form analytical expressions for the deformation at any point of a horizontal orthotropic elastic layer of infinite lateral extent (coupling in different ways such as ‘welded’, ‘smooth-rigid’, or ‘rough-rigid’ to a base) due to a long blind strike-slip fault are obtained. The results obtained are generalization of the results for an isotropic medium. For different types of coupling, the effects of variations in depth on surface displacement are presented graphically. Also, at different depth levels, the variations of surface displacements with the horizontal distance from the inclined fault are compared to study the effects of different types of coupling. The results for the present model are compared with the corresponding results for a uniform orthotropic elastic half-space. It is observed that the displacement field varies more significantly in an orthotropic elastic layered half-space in comparison with a uniform orthotropic half-space. Numerically, the effect of anisotropy is also examined. It is found that anisotropy of the source half-space has a significant effect on the displacement at different depth levels.

KEYWORDS: Static Deformation, Surrounding Faults, Orthotropic Medium, Blind Fault, Strike-Slip

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