

## Nonlinear Defects and Discombinations in Anisotropic Solids

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**Abstract :** In this paper, we present some analytical solutions for the stress fields of nonlinear anisotropic solids with line and point defects distributions. In particular, we determine the induced stress fields of a parallel cylindrically-symmetric distribution of screw dislocations in infinite orthotropic and monoclinic media as well as a cylindrically-symmetric distribution of parallel wedge disclinations in an infinite orthotropic medium. For a given distribution of edge dislocations, the material manifold is constructed using Cartan's moving frames and the stress field is obtained assuming that the medium is orthotropic. Also, we consider a spherically-symmetric distribution of point defects in a transversely isotropic spherical ball. We show that for an arbitrary incompressible transversely isotropic ball with the radial material preferred direction, a uniform point defect distribution results in a uniform hydrostatic stress field inside the spherical region the distribution is supported in. Finally, we find the stresses induced by a discombination in an orthotropic medium.

**Keywords :** defects, disclinations, dislocations, monoclinic solids, nonlinear elasticity, orthotropic solids, transversely isotropic solids

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