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Editorial

Preface to: Anisotropic Green's functions and BEMs

This special issue of *Engineering Analysis with Boundary Elements* is devoted to the subject of anisotropic Green's functions and the corresponding BEM modeling. Anisotropic elasticity is an old field, but has witnessed tremendous development in recent years. Revived research interest in this field is largely due to the advance of lighter and stronger composite materials, and is currently expanded to various coupling and multiphase fields, including piezoelectricity, magnetoelasticity, magneto-electro-elasticity, and even thermo-magneto-electro-elasticity.

The 13 original papers in this Issue are collected from experts working in the areas of anisotropic Green's functions and BEMs, intending to provide a comprehensive report on the current progress of this topical field. Five papers are focused on the Green's function solutions for a variety of anisotropic materials within different spaces, including 2D Green's functions for thermal magnetoelectroelastic solids (Qin), screw-dislocation Green's functions for the film-substrate (Wang and Wu), 2D/3D bimaterial Green's functions for transversely isotropic magneto-electro-elastic media (Ding et al.), Green's displacements and stresses in a transversely isotropic half-space due to rectangular loads (Yue et al.), and 3D anisotropic elastic Green's functions with multiple roots (Phan et al.). Two papers are on the characterization of the effective material properties in 2D piezoelectric materials using the boundary node method (Wang et al.) and in 3D composites employing the weakly singular integral equation (Chen and Liu). There are four papers dealing with various crack/fracture problems, including the exact point-temperature solution for a penny-shaped crack in a transversely isotropic thermo-piezo-elastic infinite space (Chen et al.), the interaction analysis between cracks and inclusions in 2D anisotropic elastic media based on the BEM (Dong and Lee), numerical Green's functions for the bounds of the electric induction intensity factors in a piezoelectric plane with multiple cracks (Denda and Mansukh), and 3D BEM for piezoelectric fracture analysis (Sanz et al.). One paper is on the transient wave scattering by a crack in an anisotropic plane based on the time-domain BEM (Tan et al.) and the other is focused on the stress analysis in anisotropic functionally graded materials using the meshless local Petrov–Galerkin method (Sladek et al.).

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