

Closed-form Solutions of the Cross-anisotropic Stratum Due to a Point Heat Source

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Abstract

The objective of this paper is to present the closed-form solutions of the long-term displacements and temperature change of a cross-anisotropic medium subjected to a point heat source at great depth. The medium is first assumed to be cross-anisotropic in mechanical and thermal properties. Under this assumption, the properties of the materials are different in plane of isotropy and in planes normal to it. Using Hankel and Fourier transforms, this paper presents the analytic solutions to this kind of problems, such as the repositories of nuclear wastes. The general solutions are then further simplified to cases when the material is isotropic in mechanical properties and finally totally isotropic in each property of the stratum.

Keyword : Closed-form Solutions, Cross-anisotropic Stratum, Point Heat Source