APCOM & ISCM
11-14th December, 2013, Singapore

Stress Intensity Factor Analysis of a Three-dimensional Interfacial Corner of Boned Anisotropic Piezoelectric Materials

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Hwu and Ikeda obtained asymptotic solutions around an interfacial corner of bonded several piezoelectric materials by the combination of the extended Stroh formalism and the Williams eigenfunction method. The *H*-integral method, which is derived from Betti's reciprocal principle, is useful for analyzing the stress intensity factors (SIFs) of cracks and corners. By expanding these theories for a three-dimensional interfacial corner between anisotropic piezoelectric multi-materials, we developed the modified *H*-integral method. This method has high generality that can deal a jointed corner with various numbers of piezoelectric materials and several boundary conditions on the corner surfaces. We proposed a new definition of SIFs of an interfacial corner of bonded anisotropic piezoelectric multi-materials, which is compatible with the definitions of SIFs of a crack in a homogeneous material and an interfacial crack. Proposed SIFs are applicable in various coordinate systems.

Keywords: Interfacial Corner, Piezoelectric Materials, H-integral, Stress Intensity Corner