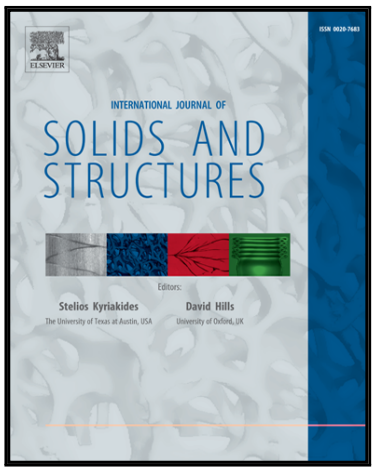

Analysis of axis symmetric circular crested ELASTIC Wave GENERATED during Crack Propagation in a Plate: A Helmholtz Potential Technique

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ANALYSIS OF AXIS SYMMETRIC CIRCULAR CRESTED ELASTIC WAVE GENERATED DURING CRACK PROPAGATION IN A PLATE: A HELMHOLTZ POTENTIAL TECHNIQUE

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ABSTRACT

This paper presents cylindrical coordinate solutions of axis symmetric circular crested elastic waves that appear due to sudden energy release during incremental crack propagation in a plate. Axis symmetric assumption decouples the elastic wave problem to Lamb (P+SV) and shear (SH) horizontal waves. Helmholtz decomposition principle was used to decompose displacement field in to unknown scalar and vector potentials; and body force vectors to known excitation scaler and vector potentials respectively. Therefore, Navier-Lame equations yield a set of four inhomogeneous wave equations of unknown potentials Φ, H_r, H_θ, H_z and known excitation potentials $A^*, B_r^*, B_\theta^*, B_z^*$. There are two types of potentials exist in a plate for axis symmetric circular crested Lamb wave: pressure potentials Φ, A^* and shear potentials H_θ, B_θ^*. Inhomogeneous wave equations for Φ and H_θ were solved due to generalized excitation potentials A^* and B_θ^* in a form, suitable for numerical calculation. The theoretical formulation

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