Fracture Dynamic Analysis of Cracked Reissner Plates Using the Boundary Element Method

J. Useche ✉

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Abstract

This work presents a Dual Boundary Element Method/Dual Reciprocity Boundary Element Method formulation for the dynamic analysis of fractured shear deformable plates. Equations for the Dual Boundary Element Method, including the direct boundary and the traction boundary equation for Reissner plates, were used for crack modeling. The Dual Reciprocity Boundary Element Method was used to treat both domain integrals related to distributed forces and inertial terms. Proposed formulation considers the rotary inertia of the plate. A general crack modeling strategy is presented. The J-Integral is used to evaluate the Dynamic Stress Resultant Intensity Factors. Test problems, including comparisons to Finite Element Method solutions, are presented. Results demonstrate, proposed formulation is a reliable method for dynamic analysis of shear deformable cracked plate bending problems.