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Dynamic Modeling of Orthotropic Cracked Materials by X-FEM

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Abstract : In this paper, dynamic fracture behaviors of cracked orthotropic structure are modeled using extended finite element method (X-FEM). In this approach, the finite element method model is first created and then enriched by special orthotropic crack tip enrichments and Heaviside functions in the framework of partition of unity. The mixed mode stress intensity factor (SIF) is computed using the interaction integral technique based on J-integral in order to predict cracking behavior of the structure. The developments of these procedures are programmed and introduced in a self-software platform code. To assess the accuracy of the developed code, results obtained by the proposed method are compared with those of literature.

Keywords : X-FEM, composites, stress intensity factor, crack, dynamic orthotropic behavior
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