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XFEM buckling analysis of cracked composite plates

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ABSTRACT

Linear eigenvalue buckling analysis for cracked uni-layer composite plates is performed in the framework of the extended finite element method (XFEM). The geometry of the problem is discretized using the 8-noded degenerated shell element, which includes transverse shear deformation effects. The effects of several parameters such as crack lengths and angles, fiber directions and boundary conditions on the buckling behavior of cracked composite plates are comprehensively investigated for different loading conditions including compressive, tensile and shear loadings. Also, the accuracy and efficiency of the proposed method are discussed and compared with the available results.

Keywords: *Buckling analysis, Extended finite element method (XFEM), Crack, Composite plate, Orthotropic tip enrichment functions*

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