Mathematics > Numerical Analysis

Natural frequencies of cracked functionally graded material plates by the extended finite element method

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In this paper, the linear free flexural vibration of cracked functionally graded material plates is studied using the extended finite element method. A 4-noded quadrilateral plate bending element based on field and edge consistency requirement with 20 degrees of freedom per element is used for this study. The natural frequencies and mode shapes of simply supported and clamped square and rectangular plates are computed as a function of gradient index, crack length, crack orientation and crack location. The effect of thickness and influence of multiple cracks is also studied.

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