

Accepted Manuscript

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PII: S0263-8223(16)30970-9

DOI: <http://dx.doi.org/10.1016/j.compstruct.2016.09.065>

Reference: COST 7791

To appear in: *Composite Structures*

Received Date: 19 June 2016

Revised Date: 17 September 2016

Accepted Date: 22 September 2016



Please cite this article as: Nasirmanesh, A., Mohammadi, S., Eigenvalue buckling analysis of cracked functionally graded cylindrical shells in the framework of the extended finite element method, *Composite Structures* (2016), doi: <http://dx.doi.org/10.1016/j.compstruct.2016.09.065>

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Eigenvalue buckling analysis of cracked functionally graded cylindrical shells in the framework of the extended finite element method

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ABSTRACT

In this study, eigenvalue buckling analysis for cracked functionally graded cylindrical shells is performed using eight noded degenerated shell elements in the framework of the extended finite element method. First, validity and efficiency of the proposed method in comparison with available results are examined and then the approach is utilized for examining cracked FGM cylindrical shells subjected to different loading conditions, including axial compression, axial tension and combined internal pressure and axial compression. Also, the effects of various parameters such as crack length and angle, gradient index of the material, aspect ratio of the cylinder and internal pressure on the buckling behavior are extensively investigated.

Keywords: *Buckling, cylindrical shell, Extended finite element method (XFEM), Crack, Functionally graded material (FGM)*

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