

## Wrinkling Prediction of Membrane Composite of Varying Orientation under In-Plane Shear

**Authors :** F. Sabri, J. Jamali

**Abstract :** In this article, the wrinkling failure of orthotropic composite membranes due to in-plane shear deformation is investigated using nonlinear finite element analyses. A nonlinear post-buckling analysis is performed to show the evolution of shear-induced wrinkles. The method of investigation is based on the post-buckling finite element analysis adopted from commercial FEM code; ANSYS. The resulting wrinkling patterns, their amplitude and their wavelengths under the prescribed loads and boundary conditions were confirmed by experimental results. Our study reveals that wrinkles develop when both the magnitudes and coverage of the minimum principal stresses in the laminated composite laminates are sufficiently large to trigger wrinkling.

**Keywords :** composite, FEM, membrane, wrinkling

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