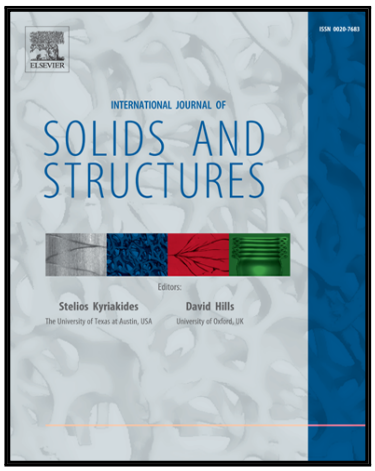

Stress distributions and mechanical properties of laminates $[\theta_m/90_n]_S$ with closed and open cracks in shear loading

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Highlights

- A stress-based variational model is developed to study the effective in-plane compliance and the stress distribution in symmetrical laminates with open and closed cracks.
- The governing equations for the two types of cracks are derived using a variational approach with the principle of minimum complementary energy.
- The inter-laminar shear stresses are assumed to be the form of general functions.
- The expressions of the stress components for the closed and the open cracks are respectively obtained from the equilibrium equations and the boundary conditions.
- Analysis of strain energy and analysis of deformation on surface are used to estimate the effective in-plane shear properties of the laminates.
- Limits of the compliance elements and the stress distributions at the infinite crack density are compared to results of the classical laminates theory.