

A Numerical Study on the Fatigue Delamination Growth under Mode II Loading in Composite Laminates

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Abstract.

In this paper, a numerical tool able to mimic the delamination growth under cyclic loading conditions, has been adopted to investigate the interlaminar damage growth under mode II loading in composite laminates. A Virtual Crack Closure Technique based model, characterized by mesh and load step independency, has been combined with the Paris-Law equations to account for the effects of cycling loading conditions on the structural behaviour of an End-Notched Flexure (ENF) specimen. The ANSYS FEM environment has been adopted for the simulations and the numerical model has been implemented by adopting the Ansys parametric design language. Comparisons at coupon level with literature experimental data on unidirectional ENF samples, has demonstrated the ability of the numerical model to simulate the Mode II fatigue delamination growth. Actually, useful indications on the damage propagation under fatigue loading condition has been provided by the proposed numerical model in conjunction with the experimental data taken from literature.