

This study considers the intra-laminar damage mode in composite structures and its effect on delamination prediction. The progressive damage models for matrix cracking and fibre failure in ABAQUS, based on Hashin's model, are only available for shell elements. The results presented here show that the predicted matrix cracking based on the damage model presently available in ABAQUS diverges from experimental results. A new model based on strain failure criteria, which can be used with both shell elements and 3D solid elements, has been developed. The effect of friction coefficient and enhancement factor on the delamination lobes within the delamination area was investigated, and it is shown that the intact zone can be captured in laminate $[0_3/90_3]_s$ and $[90_3/0_3]_s$ subjected to low-velocity impact, by using an enhancement factor of $\eta = 0.75$, and friction coefficient ≥ 0.5 , together with the new model proposed here.