FE Analysis of the Notch Effect on the Behavior of Repaired Crack with Bonded Composite Patch in Aircraft Structures

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Abstract : In this paper, the finite element analysis is applied to study the performance of the bonded composite reinforcement or repair for reducing stress concentration at a semi-circular lateral notch and repairing cracks emanating from this kind of notch. The effects of the adhesive properties on the variation of the stress intensity factor at the crack tip were highlighted. The obtained results show that the stress concentration factor at the notch tip is reduced about 30% and the maximal reduction of the stress intensity factor is about 80%. The adhesive properties must be optimized in order to increase the performance of the patch repair or reinforcement.

Keywords : bonded repair, notch, crack, adhesive, composite
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