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Résumé :

The technique of repairing or reinforcing cracked metallic structures has been widely used to extend their service life. In this study, the finite element method is used to analyze the

behaviour of a crack repaired by a boron/epoxy patch by computing the stress intensity factor at the crack tip in mode I and mixed mode. The effects of the mechanical and geometrical properties of the patch as well as the harmful disbond effect on the fracture parameters are highlighted. The results show that the stress intensity factor is affected by the negative disbond effect. A disbond around the crack provokes its growth causing a shorter life of a cracked plate, but a full-width disbond has the worst effect. The stress intensity factor in the presence of disbond is appreciably reduced when the patch thickness approaches that of the plate ($e_R/e_P \rightarrow 1$). Beyond this ratio, a linear relation links them. It is noted that the disbond develops in the ...