Fracture Mechanics Modeling of a Shear-Cracked RC Beams Shear-Strengthened with FRP Sheets

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Abstract : So far, the conventional experimental and theoretical analysis in fracture mechanics have been applied to study concrete flexural- cracked beams, which are strengthened using fiber reinforced polymer (FRP) composite sheets. However, there is still little knowledge about the shear capacity of a side face FRP- strengthened shear-cracked beam. A numerical analysis is herein presented to model the fracture mechanics of a four-point RC beam, with two inclined initial notch on the supports, which is strengthened with side face FRP sheets. In the present study, the shear crack is forced to conduct by using an initial notch in supports. The ABAQUS software is used to model crack propagation by conventional cohesive elements. It is observed that the FRP sheets play important roles in preventing the propagation of shear cracks.

Keywords : crack, FRP, shear, strengthening
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