

A J integral based method to measure fracture resistance and cohesive laws in materials exhibiting large scale plasticity - DTU Orbit (08/11/2017)

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A method is developed to extract the fracture resistance and mode I cohesive law of nonlinear elastic-plastic materials using a Double Cantilever Beam (DCB) sandwich specimen loaded with pure bending moments. The method is based on the J integral which is valid for materials having a non-linear stress-strain relationship as long as there is no unloading at any material point. A numerical parameter study is performed for a wide range of material and specimen parameters to examine the accuracy of the method. In the range examined, the error of the method is less than 11% and thus it can be used to measure the fracture resistance experimentally and determine the mode I cohesive law including its shape.

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