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Numerical investigation of rousselier ductile fracture with Extended Finite Element Method (XFEM)

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This contribution aim is to develop the extended prediction of numerical simulation for crack ductile fracture behaviors. The Rousselier's damage model is chosen to describe the damage mechanism by implementing their constitutive law into UMAT subroutine code. In order to enhance the development of crack growth, the Extended Finite Element Method (XFEM) is used, which has a capability to calculate the discontinuity element without need any remeshing purpose. This study is discussed in the context of finite element results of a symmetrically single-notched and CTS specimen, which will be verified with experimental data. As a result, these were found to be good correlation in terms of stress-strain curve, the crack path and also load-displacement accuracy. Therefore, from this experience, it is demonstrated that the capability of XFEM linked with Rousselier's model for resulting numerical formulation in structural damage benchmark problems.

Biography

Meor Iqram Meor Ahmad joined the Department of Mechanical Engineering at The University of Sheffield in May 2015 as a Ph.D. student and currently in the 3rd years of his research. He is the committee member of Computer-Aided Aerospace and Mechanical Engineering (CA2M) Research Group at the University of Sheffield. He also has been published six journal papers since becoming researchers in his research area. His research interest is in the mathematical modeling of structural integrity, fracture damage and creep.

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