



Meshless Methods for 3D Fracture Modelling with Level Sets

By Zhuang, Xiaoying

Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | A numerical framework for modelling arbitrary crack propagation in 3D | Accurate analysis of fracture is of vital importance yet methods for effective 3D calculations are currently unsatisfactory. In this book, novel numerical techniques are developed which solve many of these problems. At the start of the book, various issues relating to the meshless methods in general are dealt with although the vision is always on the 3D fracture modelling. Studies are presented concerning the solution accuracy, error control, modified weak forms and implementation. In the latter part, a simple and efficient numerical framework is developed to overcome the difficulties in current 3D fracture modelling. One major focus is the innovative use of level sets in 3D fracture modelling with the meshless methods which has been explored in a number of different ways. Difficulties related to accurate jump enrichment in the meshless methods and advancement of level sets are highlighted and solved by the developed methods. The work presented is applicable to the fracture modelling of engineering materials such as steel, concrete and rock. The book is adopted from the author's PhD thesis awarded with Zienkiewicz prize for the best PhD thesis...



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