
Abstract: This paper presents a method for the automatic simulation of quasi-static crack growth in 2D linear elastic bodies with existing cracks. A finite element algorithm, based on the so-called \( \vartheta \) method, provides the load vs. crack extension curves in the case of stable rectilinear crack propagation. Since the approach is both theoretically general and simple to be performed from a computational point of view, it appears very suitable for the extension to curvilinear crack propagation in nonlinear materials.

AMS subject classifications: 47A10, 65F10

Keywords: Linear Elastic Fracture Mechanics (LEFM), \( \vartheta \) method, Stable crack propagation, Finite Element Method (FEM)

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