

Modeling and Simulation of Three-Dimensional Crack Growth

Gregory Rodin, Professor, ASE/EM

Abstract: Fracture mechanics is concerned with analysis of growing cracks. Initially, its applications were concerned with structural materials like metals and concrete, and those applications relied on rather simple two-dimensional models. More recent applications involving hydraulic fracturing, aging infrastructure, and biomechanics require not only more complex three-dimensional models, but also modeling of various chemical and transport processes. Recent experimental and theoretical results of my colleagues at UT and University of Minnesota inspired me to pursue several aspects of three-dimensional aspects of crack growth, particularly relevant to such diverse applications as hydraulic fracturing and rupture of amniotic sacs.

