

# Procrack: A software for simulating three-dimensional fatigue crack growth

Frank Rabold<sup>1</sup>

A finite element software for automated simulation of fatigue crack growth in arbitrarily loaded three-dimensional components is presented. The criterion, direction and amount of crack propagation are controlled by concepts of linear elastic fracture mechanics. The fracture mechanical parameters are calculated by means of a special submodelling technique in combination with the interaction integral technique. In the adaptive crack growth step, the updated crack front position is determined and the mesh in the crack region is automatically adapted. The preprocessing and main FEM-analysis of the cracked structure are done using the commercial software ABAQUS. Two application examples show the capability of the simulation program.

---

<sup>1</sup> TU Bergakademie Freiberg, Institut für Mechanik und Fluidodynamik,  
rabold@imfd.tu-freiberg.de