

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**Eigenfracture: An Eigendeformation
Approach to Variational Fracture**

邀请人: 明平兵研究员

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报告地点: 科技综合楼三层 **311**

计算数学所报告厅

Abstract:

We propose an approximation scheme for a variational theory of brittle fracture. In this scheme, the energy functional is approximated by a family of functionals depending on a small parameter and on two fields: the displacement field and an eigendeformation field that describes the fractures that occur in the body. Specifically, the eigendeformations allow the displacement field to develop jumps that cost no local elastic energy. However, this local relaxation requires the expenditure of a certain amount of fracture energy. We prove the Γ -convergence of the eigendeformation functional sequence, and of finite element approximations of the eigendeformation functionals, to the Griffith-type energy functional introduced in Francfort and Marigo [J. Mech. Phys. Solids, 46 (1998), pp. 1319–1342]. This type of convergence ensures the convergence of eigendeformation solutions, and of finite element approximations thereof, to brittle-fracture solutions. Numerical examples concerned with quasi-static mixed-mode crack propagation illustrate the versatility and robustness of the approach and its ability to predict crack-growth patterns in brittle solids.

(Joint work with F. Fraternali (Univ. of Salerno, Italy) and M. Ortiz (Caltech, USA))

欢迎大家参加!