Kolloquium Mechanik

RUHR-UNIVERSITÄT BOCHUM

UNIVERSITÄT DORTMUND

Vortragsankündigung

Referent: **JERZY PAMIN**
University of Technology, Cracow, Poland

Thema: **GRADIENT PLASTICITY WITH AVERAGED STRAIN MEASURE: FORMULATION, DISCRETISATION AND LOCALIZATION SIMULATIONS**

Ort: **Ruhr-Universität Bochum**
Raum IA 3/21

Zeit: **Mittwoch, den 24.09.2003**
13:00 Uhr

Inhalt:

Since the potential of Laplacian as an averaging operator was discovered for the mechanical community by Aifantis and Bazant in 1984, and since the finite element gradient plasticity model was proposed by de Borst and Muehlhaus in 1991, gradient plasticity theories with yield functions in the stress space have been pursued. However, gradient damage models formulated in strain space by Peerlings, Geers and de Borst have been found much more efficient computationally.
The lecture examines a strain space gradient plasticity theory which involves an additional averaging equation similar to gradient damage. The discussion starts from the motivation and an overview of existing gradient regularization techniques. Then, the strain space counterpart of the classical plastic flow theory is summarized and the new format suitable for the implicit averaging of an invariant strain measure is presented. The thermodynamic relevance of the models is briefly addressed.
The finite element and element-free Galerkin implementation of the theory is used for numerical simulations. The performance of the model in strain localization problems is examined. A one-dimensional bar in tension and a two-dimensional specimen in plane strain biaxial compression are analyzed. The sensitivity of the results to the discretization and to the internal length scale is discussed.

Veranstalter:
O.T. Bruhns, K. Hackl, J.F. Kalthoff, S. Reese (Ruhr-Universität Bochum)
H. Obrecht, B. Svendsen, K. Thermann (Universität Dortmund)

Internet: www.ruhr-uni-bochum.de/mechanik/kolloquium.html