



Modelling of Metal Plasticity in Finite Element Analysis

Dr. Anxin Ma

For the accurate simulation of polycrystalline metallic structures deformation, crystal plasticity finite element is most suitable. Students of this course will learn the theoretical foundations of CPFEM and understand the relation between the microstructures (e.g. crystal orientation) evolution and the mechanical behaviour of metals during large deformations. It will be demonstrated, how information about micro-structural features is introduced into constitutive models. Furthermore, it will be shown how numerical methods should be applied to successfully run finite element simulations. By taking this course, students will develop theoretical understanding and practical skills in modern engineering applications of the finite element method.

Contents:

Basics of continuum mechanics.

Self-consistent method, CPFEM method, ABAQUS UMAT developing skill.

Single crystal and polycrystal deformation modelling.

Lectures: Lectures and computer exercises.

Requirements: Basic knowledge of mechanics, FEM and material science.

Audience: Master students and PhD students.

Time: Friday 13.30-17.00, starting from October 19, 2012.

Place: Universitätsstraße 90a, ICAMS seminar room 2 and CIP-pool

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