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Friedrich-Alexander-Universität
Erlangen-Nürnberg



Seminar über Fragen der Mechanik

zu folgendem Vortrag wird herzlich eingeladen

Montag, **05.11.2012, 14:15 Uhr**, Egerlandstr. 5, Raum 0.044

Single and Multi Scale Methods for Modeling Fracture and Crack Propagation: Methods, Software and Tools

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It has been widely recognized that many macroscopic phenomena originate from the mechanics of the underlying microstructure. The size, shape, spatial distribution, volume fraction and properties of the constituents making up the microstructure all have a significant impact on the behaviour of the material observed at the macro scale. The effect of lower scales of the material on its fracture behaviour is a lot more severe. Therefore, multiscale modelling of fracture has been a very hot area of research in the last decade.

During this talk, a short overview of the modelling of discrete cracks at several scales will be presented. The scales include atomistic, meso and macro length scales. The focus will be more on the continuum modelling of discrete cracks using the enriched type methods (extended meshfree and finite elements) for brittle and quasi-brittle materials. Next, the concurrent and semi-concurrent multiscale methods for fracture will be reviewed in brief. Then, the concurrent multiscale modelling of crack propagation will be formulated in more detail.

Finally, an open source library called PERMIX will be introduced which is an effort to provide a framework to implement multiscale methods and particular fracture models. The novel object oriented design of PERMIX will be introduced and some examples are shown which were solved using PERMIX.

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