Seminar im Rahmen des GRK 2078

Referent: **Prof. Dr.-Ing. Carolin Birk**
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Datum: Mi., 07.02.2018
Uhrzeit: 14:30 Uhr

Ort: Geb. 10.23, 3. OG (R 308.1 – KM-Seminarraum)

Titel: **Scaled boundary polygon elements for elastodynamics and material modelling**

Abstract

The scaled boundary finite element method (SBFEM) is a semi-analytical technique which originated in the field of dynamic soil-structure interaction. It combines discretization techniques in the circumferential directions of a problem domain with an analytical solution of the resulting ordinary differential equations with respect to a radial coordinate. Due to its semi-analytical nature, it excels in modelling dynamic problems in unbounded domains and stress singularities. While it has been considered a niche technique earlier, it is currently experiencing a rapid development towards a general purpose method. Recent advances with respect to that development will be summarized in this presentation.

The scaled boundary finite element method (SBFEM) can be used to construct polygon and polyhedral elements with an arbitrary number of edges or faces, respectively, and arbitrary numbers of nodes on each edge and thus provides great flexibility in mesh generation. As a special case, it can be used on structured meshes without the need to treat hanging nodes. Such quadtree or octree meshes can be obtained automatically using image-based techniques and thus are promising with respect to material modelling. For elastodynamic problems, high-order elements can be incorporated easily allowing for the efficient simulation of high-frequency waves. The key aspects and performance of the SBFEM will be illustrated using examples of wave scattering and radiation in highly heterogeneous domains as well as applications related to computational homogenization.

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Alle Interessenten sind herzlich eingeladen.
Prof. Dr.-Ing. Thomas Böhlke