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25. August 2016

Einladung zum Vortrag

von

Dr. Thomas Carraro

Universität Heidelberg

Computation of effective transport parameters for fuel cells and batteries using the eXtended Finite Element Method (XFEM)

In electrochemical modeling and simulation, the theory of porous electrodes has been widely developed and applied during the last decades. In particular, reduced models derived by homogenization have been successfully used in simulations of porous electrodes for solid oxide fuel cells and lithium ion batteries. Homogenized models are upscaled approximations of the underlying physical phenomena that need effective parameters to describe the macroscopic behavior.

In this talk, we discuss the computation of effective parameters performed on three dimensional complex geometries that are obtained by the segmentation of tomographic image data from real electrodes. Since the segmented data is usually available as a voxel structure, our goal is to combine (i) the flexibility of computing using this data (i.e. on structured grids) and (ii) the accuracy of computing better approximations of the complex geometries. To achieve this goal we apply the extended finite element method and use cut-cells to approximate the complex boundary of the computational domain by a level set method. We show numerical results comparing the results of voxel-based versus xfem-based computations of effective transport coefficients.

Termin: **Donnerstag, 29. September 2016, 10:00 Uhr**

Ort: **Universität Ulm, Helmholtzstr. 22, Raum 2.22**

Der Vortrag findet im Rahmen des Forschungsseminars des Institutes für Stochastik statt.
Alle Interessenten sind herzlich eingeladen.

gez. V. Schmidt