E i n l a d u n g

zu der am Mittwoch, dem 17. Dezember 2008,
um 11.15 Uhr im Hörsaal M 6 stattfindenden

A n t r i t t s v o r l e s u n g

von Herrn PD Dr. Carsten Wolters

über das Thema

EEG/MEG source analysis:
From basic mathematical concepts to clinical application

Abstract:
Bioelectromagnetic source reconstruction in the human brain from scalp Electro- and Magneto-encephalography (EEG/MEG) signals is sensitive to head volume conductor properties, i.e., tissue geometries and conductivities. A mathematical dipole is widely used as the model of the primary current source. Since the inverse problem is not uniquely solvable, different classes of approaches exist and will be presented, which are based on different a-priori knowledge. All inverse methods are based on solutions to the corresponding forward problem, i.e., the simulation of the electric potential and the magnetic flux at the head surface for a dipole in the cortex sheet of the human brain.
In my talk, I will propose different approaches to model the dipole singularity introduced into the differential equation within the finite element (FE) method based solution to the EEG/MEG forward problem. The presented approaches will be validated using high-resolution constrained Delaunay tetrahedralizations and geometry-adapted hexahedral meshes in a multi-layer anisotropic sphere model.
A successful application of the presented approaches in the field of presurgical epilepsy diagnosis will finally be discussed.

gez. Joachim Cuntz, Dekan