ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to the Doctoral Seminar

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"Inverse Problems in Magnetic Particle Imaging"

I.1.04 | Tuesday, 13 November 2018 | 1:00 p.m.

Abstract

Magnetic particle imaging (MPI) is a novel tracer-based medical imaging modality with a potentially high resolution that can be used, e.g, to visualize blood flow. To this end, magnetic particles are injected into the blood stream. A strong external magnetic field with a field-free point (FFP) is applied, such that the magnetic moments of the particles align with this field, with the exception of the FFP. A second external field, the so-called excitation field, is applied to change the magnetization of the particles that are situated in the FFP. This change in the magnetization induces an electric current in the receive coils, which yields the data for this imaging technique. In order to obtain an image of the entire body, the FFP is moved along a trajectory that covers the area of interest. Both the calibration as well as the imaging process itself require the solution of inverse problems. This talk is intended to give an overview of MPI and the arising mathematical challenges.

Barbara Kaltenbacher and the Department of Mathematics look forward to seeing you at the talk!