KARL-FRANZENS-UNIVERSITÄT GRAZ
UNIVERSITY OF GRAZ
Institute of Mathematics and Scientific Computing

INVITATION

to the talk of

Armin Rund
(University of Graz, BioTechMed)

Title: Time optimal control of the Bloch equation

Time: Wednesday, 6th of July, 2016, 11:00

Place: SR 11.34, Heinrichstraße 36, 3rd floor, 8010 Graz

Institute of Mathematics and Scientific Computing

Abstract:

A study in Magnetic Resonance Imaging (MRI) usually consists of a cyclic change between excitation and measurement. The talk focuses on the optimization of the excitation process in order to reduce the scanning times in MRI. A single excitation leads to a time optimal control problem for the underlying Bloch equation describing the nuclear magnetization.
It is a bilinear control problem with state-constraints describing a proper excitation profile.
The problem is highly nonconvex and possesses a possibly infinite number of local minimizers with varying objective values. A bilevel method with a new globalization technique and based on a semismooth quasi-Newton method is proposed. The method is tested in numerical experiments.

Univ.-Prof. Dr. Karl Kunisch
Head of Institute of Mathematics and Scientific Computing

Heinrichstraße 36, 8010 Graz, Austria
Phone: +43 (0) 316 / 380-5162
Fax: +43 (0) 316 / 380-9827
E-Mail: karl.kunisch@uni-graz.at
Homepage: http://math.uni-graz.at