ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to the Doctoral Seminar

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"Optimality of pulse energy for photoacoustic tomography"

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Abstract

Photoacoustic tomography (PAT) is a rapidly evolving imaging technique that combines high contrast of optical imaging with high resolution of ultrasound imaging. Using typically noisy measurement data, one is interested in identifying some parameters in the governing PDEs for the photoacoustic tomography system. Hence, an essential factor in estimating these parameters is the design of the system, which typically involves multiple factors that can impact the accuracy of reconstruction. In this work, employing a Bayesian approach to a PAT inverse problem we are interested in optimizing the laser pulse of the PAT system in order to minimize the uncertainty of the reconstructed parameter. Additionally, we take into account wave propagation attenuation for the inverse problem of PAT, which is governed by a fractionally damped wave equation. Finally, we illustrate the effectiveness of our proposed method using a numerical simulation.

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