

Analysis of a forward problem in optical tomography

Matthias Schlottbom, TU Darmstadt, Herbert Egger, TU Darmstadt

schlottbom@mathematik.tu-darmstadt.de

The inverse problem of optical tomography, which is a non-invasive medical imaging technique, consists in the recovery of optical parameters from boundary measurements of near-infrared light. On the contrary, given some optical parameters, the calculation of the boundary measurements through a photon field evoked by a boundary light source is called the forward problem of optical tomography. The widely accepted photon transport model is the radiative transfer equation. In this talk, we will present some existence results in L^p spaces for the radiative transfer equation, which, in turn, will be used to analyze the forward problem with respect to continuity and differentiability. Finally, we will apply these results to Tikhonov-type regularization schemes.