Identifying Conductivity in Electrical Impedance Tomography with Total Variation Regularization[*]

M. Hinze[1], B. Kaltenbacher[2], and <u>T. N. T. Quyen</u>[1,3]

Abstract: In this paper we investigate the problem of identifying the conductivity in electrical impedance tomography from one boundary measurement. A variational method with total variation regularization is here proposed to tackle this problem. We discretize the PDE as well as the conductivity with piecewise linear, continuous finite elements. We prove the stability and convergence of this technique. For the numerical solution we propose a projected Armijo algorithm. Finally, a numerical experiment is presented to illustrate our theoretical results.

[1] Department of Mathematics
University of Hamburg
Bundesstraße 55, 20146 Hamburg, Germany
{*michael.hinze, quyen.tran*}*@uni-hamburg.de*

[2] Institut für Mathematik
Alpen-Adria-Universität Klagenfurt
Universitätsstraße 65-67, A-9020 Klagenfurt, Austria
Barbara.Kaltenbacher@aau.at

[3] Institut für Numerische und Angewandte Mathematik
Georg-August-Universität Göttingen
Lotzestraße 16–18, 37083 Göttingen, Germany