
PETRI OLA, University of Helsinki, Helsinki, Finland

Impedance tomography with an imperfectly known boundary

Electrical impedance tomography (EIT) aims to reconstruct the electric conductivity inside a physical body from current-to-voltage measurements at the boundary of the body. In practical EIT one often lacks exact knowledge of the domain boundary, and inaccurate modeling of the boundary causes artifacts in the reconstructions. A novel method to overcome this difficulty is discussed. The first step is to determine the minimally anisotropic conductivity in a model domain reproducing the measured EIT data. This is based on a classical result due to K. Strebel on the existence of extremal quasiconformal mappings. The algorithm is applied to simulated noisy data from a realistic electrode model. Also, we present few observations on this question in three dimensions.