Electrical impedance imaging using nonlinear Fourier transform

S. Siltanen
Department of Mathematics and Statistics
University of Helsinki
PO Box 68, 00014 Helsinki, Finland
peaker@email.addr

The aim of electrical impedance tomography (EIT) is to reconstruct the inner structure of an unknown body from voltage-to-current measurements performed at the boundary of the body. EIT has applications in medical imaging, nondestructive testing, underground prospecting and process monitoring. The imaging task of EIT is nonlinear and an ill-posed inverse problem. A non-iterative EIT imaging algorithm is presented, based on the use of a nonlinear Fourier transform. Regularization of the method is provided by nonlinear low-pass filtering, where the cutoff frequency is explicitly determined from the noise amplitude in the measured data. Numerical examples are presented, suggesting that the method can be used for imaging the heart and lungs of a living patient.