Solving Electrical Impedance Tomography via Subspace-Based Optimization Method

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The Subspace-Based Optimization Method is proposed to solve the electric impedance tomography (EIT) problem. Two versions are preprinted. The first is the new fast Fourier transform subspace-based optimization method (NFFT-SOM). Instead of implementing optimization within the subspace spanned by smaller singular vectors in subspace-based optimization method (SOM), a space spanned by complete Fourier bases is used in the proposed NFFT-SOM. We discuss the advantages and disadvantages of the proposed method through numerical simulations and comparisons with traditional SOM. The second is the low frequency subspace optimized method (LF-SOM), in which we replace the deterministic current and noise subspace in SOM with low frequency current and space spanned by discrete Fourier bases, respectively. The proposed reconstruction methods are tested by numerical simulations, which show that the proposed algorithms are fast and robust.