

Using multi-frequency electrical impedance tomography (MFEIT) without phase data to reconstruct complex conductivity distribution

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Abstract

Electrical impedance tomography (EIT) is an imaging modality, where the conductivity distribution inside imaging domain is reconstructed based on electrical measurements made on the boundary. Traditionally, the only way to reconstruct the complex conductivity (in practice, conductivity and permittivity) has been to measure complex signals (i.e. both magnitude and phase). We present a novel multi frequency EIT (MFEIT) method, which enables reconstructing the complex conductivity based on only magnitude measurements on the boundary. The lack of phase data is compensated for by having measurements at multiple frequencies. Both simulated and experimental studies of the novel method are presented.