Electrical impedance tomography and virtual X-rays

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A connection between Electrical Impedance Tomography (EIT) and X-ray tomography was found in [Greenleaf et al. 2018] using microlocal analysis. Fourier transform applied to the spectral parameter of Complex Geometric Optics solutions produces virtual X-ray projections, enabling a novel filtered back-projection type nonlinear reconstruction algorithm for EIT. This approach is called Virtual Hybrid Edge Detection. It is remarkable how this new approach decomposes the EIT image reconstruction process in several steps, where all ill-posedness is confined in two linear steps. Therefore, we can separate the nonlinearity and ill-posedness of the fundamental EIT problem.