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Towards enhanced reconstruction quality in electrical impedance tomography

Electrical impedance tomography (EIT) is a non-invasive imaging modality that reconstructs the spatial distribution of electrical conductivity or impedance within a body (e.g., lungs or brain) using boundary measurements from surface electrodes. Physically, EIT can be formulated as an inverse scattering problem, where one seeks to recover the conductivity distribution of a domain from boundary data represented by the Dirichlet-to-Neumann (DtN) map. From a mathematical standpoint, this inverse problem can be reformulated as a D-bar equation.

We outline the fundamental theory underlying conductivity recovery within the D-bar formulation and identify key factors whose improvement may enhance reconstruction quality beyond that of existing methods.