Factorization and Perturbation

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Abstract

The factorization method provides an explicit characterization of the shape of an inclusion in impedance tomography or of a scatterer in inverse scattering problems. In practice the data required for this characterization is never at hand due to finite dimensional perturbed measurements. Nevertheless, perturbation theory explains why the method works when only approximate data is at hand. Moreover, it shows that regularization of the method's criterion is crucial. As an application, the insights provided by perturbation analysis are used to set up a factorization method for the complete electrode model in impedance tomography.