Mumford-Shah regularization in electrical impedance tomography with complete electrode model

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Abstract

In electrical impedance tomography, we aim to solve the conductivity within a target body through electrical measurements made on the surface of the target. This inverse conductivity problem is severely ill-posed, especially in real applications with only partial boundary data available. Thus regularization has to be introduced. The Mumford–Shah regularizer familiar for image segmentation is appropriate for targets consisting of several distinct objects or materials. It is, however, numerically challenging.

In this talk, we discuss some theoretical and numerical aspects of the Ambrosio-Tortorelli approximation of the Mumford-Shah regularizer combined with the Complete electrode model (CEM).