Acousto-electric Inverse Source Problems

Wei LI

Department of Mathematical Sciences, DePaul University, US

Email: wei.li@depaul.edu

We propose a method to reconstruct the electrical current density inside a conducting medium from acoustically-modulated boundary measurements of the electric potential. We show that the current can be uniquely reconstructed with Lipschitz stability. We also perform numerical simulations to illustrate the analytical results, and explore the partial data setting when measurements are taken only on part of the boundary. This method can also be applied to the reconstruction of the electrical current density from acoustically-modulated boundary measurements of time-harmonic electromagnetic fields. This is based on the works [1,2] with co-authors John C. Schotland, Yang Yang and Yimin Zhong.

References:
[1] Wei Li, John C. Schotland, Yang Yang, Yimin Zhong, An Acousto-electric Inverse Source Problem, SIAM Journal on Imaging Sciences, 14(4), 1601-1616(2021).
 [2] Wei Li, John C. Schotland, Yang Yang, Yimin Zhong, Inverse Source Problem for Acoustically-Modulated Electromagnetic Waves, SIAM Journal on Applied Mathematics, 83(2), 418-435(2023).