

1053-65-155

Alexandre Timonov* (atimonov@uscupstate.edu), University of South Carolina Upstate, Division of Mathematics and Computer Science, 800 University Way, Spartanburg, SC 29303. *New algorithms for reconstructing the conductivity from the interior data.*

Recent findings (see A.Nachman, A.Tamasan, and A.Timonov, *Inverse Problems*, 23 (2007), 25 (2009)) have shown that utilizing the magnitude of the current density available from MRI measurements allows for significant improving the resolution of the conductivity images. In this talk, two new algorithms for reconstructing the conductivity from the interior data are presented. The first algorithm is based on an original procedure for constructing minimizing sequences for a functional whose Euler-Lagrange equation is a nonlinear degenerate elliptic PDE governing the voltage potential. The second algorithm reconstructs locally the planar conductivity using the BVP for the system of the second order ODEs for geodesics and partial interior data. The computational feasibility of the proposed algorithms is demonstrated in numerical experiments. (Received September 01, 2009)