1086-49-295 **Annika L Jersild***, CSU 4452 PO Box 8795, Williamsburg, VA 23187, and **Padmanabhan Seshaiyer**. *A Computational Algorithm for Estimating Conductivities.* Preliminary report.

Inverse conductivity problems are widely applicable in many real-world problems such as groundwater flow and geothermal applications. One of the challenges in this area for scientists and researchers has been to develop efficient computational algorithms to estimate conductivity values that correspond to information underground through discrete data collected on the surface. In this work, we develop a computational algorithm that employs minimization of a cost function defined using the discrete data in conjunction with the solution to a coupled primal-dual formulation. The mathematical tools used in this research include the finite difference method, the steepest descent algorithm, Reisz representation theorem and definition of directional derivatives that help to formulate a unified computational algorithm to solve for the conductivities. Numerical results that validate the performance of the algorithm will be presented. (Received August 16, 2012)