

Meeting: 1003, Atlanta, Georgia, SS 4A, AMS-SIAM Special Session on Theoretical and Computational Aspects of Inverse Problems, I

1003-35-848 **Ian Knowles*** (iwk@math.uab.edu), Department of Mathematics, University of Alabama at Birmingham, 1300 University Boulevard, Birmingham, AL 35294. *Descent methods for inverse problems.*

The use of functional minimization to compute coefficient functions in parameter identification inverse problems is not new. This talk will center on a new class of non-negative functionals G with the desirable numerical property of being either convex, or provably “essentially convex” in the sense that $G(p) = 0$ whenever $G'(p) = 0$. When coupled with a suitable uniqueness theorem, such functionals have not only unique global minima, but also unique stationary points. The latter property guarantees the feasibility of descent methods. Applications to the inverse groundwater problem and electrical impedance tomography will be discussed. (Received September 30, 2004)