1067-35-2096 **Aubrey Rex Rhoden*** (aubrey.rhoden@mavs.uta.edu), 408 E. Second St., arlington, TX 76010, and **Natee Pantong**. *A Globally Convergent Numerical Method for Coefficient Inverse Problems with Applications in Thermal Tomography.*

In our terminology "globally convergent numerical method" means a numerical method, whose convergence to a good approximation for the correct solution is independent of the initial approximation. A new numerical imaging algorithm has been proposed to solve a coefficient inverse problem for an elliptic equation with the data generated by computer simulation. A rigorous convergence analysis shows that this method converges globally. A heuristic approach for approximating the "new tail-function" which is a crucial part (assuming the smallness of the tail-function) of our problem has been utilized and verified in numerical experiments, so as the global convergence. Applications to both optical and thermal tomography are discussed. Numerical experiments in the 2D thermal property reconstruction are presented. (Received September 22, 2010)