Some Numerical Methods for Hyperbolic Inverse Problems

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Abstract

for the minisimposium "Numerical Methods for Multidimensional Inverse Hyperbolic Problems" of AIP-2007 at The University of British Columbia, Vancouver, Canada

Development of numerical methods for coefficient inverse problems is one of important tasks, because of the applied nature of these problems. In this talk numerical methods for two inverse problems for hyperbolic Partial Differential Equations will be presented. The first one is for the recovery of a coefficient in the principal part of the operator (joint with J. Xin). This one is a globally convergent method. The second one is for the recovery of an initial condition of the hyperbolic equation (joint with C. Clason). Carleman estimates play a substantial role in both algorithms. Indeed, Carleman Weight Functions are used directly in the numerical scheme in the first, and convergence of the second is proven using Carleman estimates. Applied examples will be presented for imaging of land mines and thermoelastic tomography.

Acknowledgment

This work was supported by the US Army Research Laboratory and US Army Research Office under contract/ grant number W911NF-05-1-0378.