1086-35-1882   **Ting Zhou***, Department of Mathematics, MIT, 77 Massachusetts Avenue, Building 2 office 335, Cambridge, MA 02139. *Title: Quantitative thermo-acoustics and related problems.*

Abstract: Thermo-acoustic tomography is a hybrid multi-waves medical imaging modality that aims to combine the good optical contrast observed in tissues with the good resolution properties of ultrasound. Thermo-acoustic imaging consists of two steps: first to reconstruct an amount of electromagnetic radiation absorbed by tissues by solving inverse problems of acoustic waves; secondly to quantitatively reconstruct the optical property of the tissues from the absorption (reconstructed from the first step), which is an internal functional. We are mostly interested in the second step and show some uniqueness and stability results for the full Maxwell's system models under the assumption that the parameter is small, and the uniqueness, stability and reconstruction results for the scalar model. The key ingredient in showing the second result is the complex geometric optics (CGO) solutions. (Received September 24, 2012)