1077-78-1311   **John C Schotland*** (`schotland@umich.edu`), Department of Mathematics, University of Michigan, Ann Arbor, MI 48109. *Acousto-Optic Tomography and Related Inverse Problems.*

A method to reconstruct the optical properties of a highly-scattering medium from incoherent acousto-optic measurements is proposed. The method is based on the solution to an inverse problem for the diffusion equation and makes use of the principle of interior control of boundary measurements by an external wave field. Related inverse source problems are also considered. (Received September 19, 2011)