

Meeting: 1004, Bowling Green, Kentucky, SS 13A, Special Session on Nonlinear Analysis and Applied Mathematics

1004-49-87 **Vladimir Olikier*** (oliker@mathcs.emory.edu), Department of Mathematics and Computer Science, Emory University, Atlanta, GA 30322. *Variational solutions of some nonlinear problems in geometry and optics via Monge-Kantorovich optimal mass transport theory.* Preliminary report.

It is shown that existence and uniqueness of solutions to several nonlinear problems in geometry and optics can be established by applying the same variational principle motivated by the solution of the problem dual to the Monge-Kantorovich mass transport problem. In particular, this principle is applied to problems of recovering complete noncompact and compact convex hypersurfaces with prescribed Gaussian curvature (solved earlier by Aleksandrov by a different method) and to problems of constructing single and double reflectors with prescribed scattering properties.

Some of the presented results on reflectors are closely related to results obtained jointly with W. Gangbo and T. Glimm. (Received January 18, 2005)