Global uniqueness and stability of an inverse problem for the Schrodinger equation on a Riemannian manifold via one boundary measurement

Roberto TRIGGIANI

We consider a mixed problem for the Schrodinger equation on a finite dimensional Riemannian manifold with magnetic and electric potential coefficients and non-homogeneous Dirichlet boundary term. The goal is the nonlinear problem of the recovery of the electric potential coefficient by means of only one boundary measurement on an explicitly identified portion of the boundary. We obtain global uniqueness of the recovery and Lipschitz stability of the recovery on an arbitrarily short time-interval exclusively in terms of the data of the problem. The norms involved are optimal. The key ingredients are: (i) sharp Carleman-type estimates for the Schrodinger equation at the H1-level, on a Riemannian manifold and consequent continuous observability estimates at the H1-level (Triggiani-Xu, AMS,2007); (ii) related continuous observability estimates at the L2-level (Lasiecka-Triggiani-Zhang; and Triggiani 2004) (iii) optimal interior and boundary regularity of the direct mixed problem (Lasiecka-Triggiani, 1991) plus a new boundary trace result in the present contribution