Department of Mathematics

University of Houston

Scientific Computing Seminar

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Discrete conductivity and Schroedinger inverse problems

Tuesday, Oct. 11, 2016
1:30 PM- 2:30PM
Room 651G PGH

Abstract:

We consider the problem of finding the electric properties of components in an electrical circuit (i.e. possibly complex edge weights in a graph) from measurements made at few accessible nodes. This is a discrete analogue to continuum inverse problems such as electrical impedance tomography and the inverse Schroedinger problem. We show that if the linearization to the discrete inverse problem about one set of weights is injective, then the weights are determined uniquely by the measurements, except for a zero measure set. This is without making any assumption on the topology of the graph. The proof borrows ideas from the Complex Geometric Optics method that has been used to show uniqueness for continuum inverse problems like the ones mentioned above. Extensions to discrete elasticity inverse problems will be presented.