

Department of Mathematical Sciences Colloquium

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Electrical Network Mixed Problems

This research explores particular inverse problems related to the conductance recoverability in electrical networks. A Mixed Problem is defined when the boundary nodes of the system can be partitioned or divided according with the known data. For instance, I will explain the case where either the voltage or the current is known at all the boundary nodes of the system. To be able to uniquely solve these inverse problems two matrices are introduced: the Response and the Kirchhoff matrices. Using the Schur complement of the Kirchhoff matrix and some of its properties, we are able to recover the conductance of each edge in the system. More general mixed problems, where the data at some nodes is more than just voltage or current, will be presented. Finally, I will introduce a map that recovers the unknown voltage and/or current from the known data and discussed some of its properties. Motivation of the problem: Uniquely determining the voltage on the surface of a patients heart, based on measurements of voltages and currents on the patients chest.

**Friday, February 8, 2008 at 3 pm in Bell Hall 143
The University of Texas at El Paso**

Refreshments will be served in front of the colloquium room, 15 minutes before the start of the colloquium.

For further information, please contact Dr. Pavel Solin, Bell Hall 220. Phone: (915) 747-6770, email: solin@utep.edu.