TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

Monday, April 22 2019, 2:40 p.m.

Analysis of a new eigenvalue problem related to scattering by a crack

by Samuel Cogar

University of Delaware

Abstract: In this talk I will introduce a new modified transmission eigenvalue problem for scattering by a partially coated crack. Rather than study this problem in isolation, I will present a generalized Robin eigenvalue problem depending on a bounded linear operator that encodes the information for a given scattering medium. Results obtained in this general setting will then be applied to the case of scattering by a partially coated crack, including a new proof that finitely many eigenvalues exist when the surface impedance of the crack is sufficiently small. I will conclude with some numerical examples that both verify the theoretical results and demonstrate the sensitivity of the eigenvalues to changes in the material properties of the crack.