TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

Monday, May 1, 2017, 2:40 p.m.

Sobolev regularity estimates for solutions to spectral fractional elliptic equations

by Tadele Mengesha

University of Tennessee

Abstract: Global Calderon-Zygmund type estimates are obtained for solutions to fractional elliptic problems over a smooth domain. Our approach is based on the 'extension problem' where the fractional elliptic operator is realized as a Dirichlet-to-Neumann map to a degenerate elliptic PDE in one more dimension. This approach allows the possibility of deriving estimates for solutions to the fractional elliptic equation from that of a corresponding degenerate elliptic equation. We will confirm this first by obtaining weighted estimates for the gradient of solutions to a class of linear degenerate/singular elliptic problems. The class consists of those with coefficient matrix that is symmetric, nonnegative definite, and both its smallest and largest eigenvalues are proportion to a particular weight that belongs to a Muckenhoupt class. The weighted estimates are obtained under a smallness condition on the mean oscillation of the coefficients with a weight. This is a joint work with T. Phan.