TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Zoom meeting

Monday, April 4 2022, 2:30 p.m.

Calderon-Zygmund type estimates for nonlocal PDEs with Holder continuous kernel

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Abstract: I will present a result on Sobolev regularity of weak solutions to linear nonlocal equations. The theory we develop is concerned with obtaining higher integrability and differentiability of solutions of nonlocal equations. Under the assumption of uniform Holder continuity of coefficients, weak solutions from the energy space that correspond to highly integrable right hand side will be shown to have improved Sobolev regularity along the differentiability scale in addition to the expected integrability gain. This result is consistent with self-improving properties of nonlocal equations that has been observed by other earlier works. To prove our result, we use a perturbation argument where optimal regularity of solutions of a simpler equation is systematically used to derive an improved regularity for the solution of the nonlocal equation.