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James Scott*, 208 Ayres Hall, 1403 Circle Drive, Knoxville, TN 37916. *THE DIRICHLET PROBLEM FOR OPERATORS RELATED TO PERIDYNAMICS: WELL-POSEDNESS AND REGULARITY.*

The well-posedness of solutions to the Dirichlet Problem for a class of operators related to a linear peridynamic model will be presented. In peridynamics, nonlocal interactions are represented by a kernel. Typically, the kernel is a radially symmetric locally integrable compactly supported function. We consider the model equation and show well-posedness of the Dirichlet problem for kernels assumed to be only measurable functions. The existence and uniqueness of solutions is obtained using Hilbert space methods. For a special class of kernels bearing some resemblance to potentials in fractional diffusion equations, we obtain interior Sobolev regularity. Tools from harmonic analysis and potential theory are used to prove the regularity result. This talk comes from joint work with Tadele Mengesha. (Received January 31, 2018)