Analysis of an approximation of a fractional extension problem

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Abstract

In recent years numerous physically relevant phenomena have been shown to demonstrate a non-standard diffusive process known as anomalous diffusion. Such models are mathematically interesting due to the non-local nature of the involved operators, such as the fractional Laplacian. Despite the growing interest in such problems, the existing numerical methods are still plagued by reduced convergence rates and inefficient implementations. This talk will focus on approximating an abstract extension problem which is equivalent to the non-local problem of interest. From this extension problem, an efficient method with desirable convergence properties will be developed and analyzed. Numerical examples will be provided to demonstrate the results

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