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**Qiyu Sun\*** (qsun@mail.ucf.edu), Department of Mathematics, University of Central Florida, FL 32816. *Left-Inverses of Fractional Laplacian and Sparse Stochastic Processes*. Preliminary report.

The fractional Laplacian  $(-\Delta)^{\gamma/2}$  commutes with the primary coordination transformations in the  $d$ -dimensional Euclidean space: dilation, translation and rotation, and has tight link to splines, fractals and stable Levy processes. For  $0 < \gamma < d$ , its inverse is the classical Riesz potential  $I_\gamma$ . In this talk, we extend the definition of the classical Riesz potential  $I_\gamma$  to any non-integer number  $\gamma$  larger than  $d$  and apply that extension to solve the stochastic partial differential equation  $(-\Delta)^{\gamma/2}\Phi = w$  with white Poisson noise as its driving term  $w$ . (Received January 06, 2011)