Regularity theory for nonlocal operators

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In this poster, we put forward a brief introduction to the nonlocal diffusion operators. Our toy-model is the fractional Laplacian. We start with an excursion to the realm of stochastic analysis, motivating the fractional Laplacian by the study of the infinitesimal generator of a Lévy process. Then, we present a number of properties and proceed with the establishment of an ABP estimate and the Harnack inequality. As an application, we examine the regularity of the solutions in Hölder spaces. This is based on the author's M.Sc. thesis, directed by Prof. Boyan Sirakov and Prof. Edgard Pimentel.

References

[1] Caffarelli, Luis; Silvestre, Luis , *Regularity theory for fully nonlinear integro-differential equations*, Comm. Pure Appl. Math. 62 (2009) , no. 5, 597–638.