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Nonlocal equations with degenerate weights

We discuss on fractional weighted Sobolev spaces with degenerate weights and related weighted nonlocal integrodifferential equations. We provide embeddings and Poincaré inequalities for these spaces and show robust convergence when the parameter of fractional differentiability goes to 1. Moreover, we prove local Hölder continuity and Harnack inequalities for solutions to the corresponding nonlocal equations. The regularity results naturally extend those for degenerate linear elliptic equations presented in [Comm. Partial Differential Equations 7 (1982); no. 1; 77–116] by Fabes, Kenig, and Serapioni to the nonlocal setting.

This is a joint work with Linus Behn, Lars Diening and Julian Rolfes from Bielefeld.