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On regularity of sets of finite fractional perimeter in metric measure spaces

Federer's characterization states that a set is of finite perimeter if and only if its measure theoretic boundary has finite codimension 1 Hausdorff measure. In this talk, we discuss the extent to which an analog of this result holds for sets of finite s-perimeter, with $0 < s < 1$, in doubling metric measure spaces. Here the nonlocal s-perimeter is defined via a Besov seminorm, and as shown by Dávila in $\mathbb{R}^n$ and Di Marino and Squassina in the metric setting, recovers the perimeter of a set as $s \to 1^-$ under suitable rescaling. Time permitting, we will also consider a nonlocal minimization problem for the s-perimeter, as introduced by Caffarelli, Roquejoffre, and Savin in $\mathbb{R}^n$, and discuss regularity results for minimizers in the metric setting.