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Fractional Sobolev trace inequalities

We will present some Sobolev type inequalities regarding the trace of a function for the half-space $\mathbb{R}^n_+$ in the classical and fractional case.

We will start to show the result due to Escobar and independently to Beckner: there exists a positive constant K_n, depending only on n, such that for any function $f \in W^{1,2}(\mathbb{R}^n_+)$, it holds

$$\left(\int_{\mathbb{R}^{n-1}} |f(0,x)|^{\frac{2(n-1)}{n-2}} dx\right)^{\frac{n-1}{n-2}} \leq \ K_n \int_{\mathbb{R}^n_+} |\nabla f(t,x)|^2 dx dt,$$

where $(t,x) \in \mathbb{R}_+ \times \mathbb{R}^{n-1} = \mathbb{R}^n_+$.

Afterwards we will consider the case of fractional Sobolev inequalities, presenting the fractional counterpart of the previous statement and some possible generalizations. (This is a work in progress with Jie Xiao)