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ON EXTENDED SINGULAR SET OF POTENTIALS

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Abstract. We describe a class of potentials $v = G * f$, such that if x_0 is from extended singular set of v, that is, $r^{-N} \int_{B_r(x_0)} v(x)\,dx \to +\infty$ for some sequence $r \to 0$, then necessarily $v(x_0) = \infty$. This class includes Bessel potentials and Riesz potentials. The result was exploited in our previous paper in order to show that singular dimension of the Bessel potential space $L^{\alpha,p}(\mathbf{R}^N)$ (that is, the supremum of Hausdorff's dimension of extended singular sets, taken over all functions from the space) is equal to $N - \alpha p$, provided $\alpha p \leqslant N$.

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