# On the spectrum of Schrōdinger-type operators: the case of potentials with local singularities

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**Abstract**

The goal of this talk is twofold. We prove that the operator $H = L + V$, the perturbation of the Taibleson-Vladimirov multiplier $L = \mathfrak{D}^\alpha$ by the potential $V(x) = b \, \|x\|^{-\alpha}$, $b \geq b_*$, is essentially self-adjoint and non-negative definite (the critical value $b_*$ depends on $\alpha$ and will be specified in our talk). While the operator $H$ is non-negative definite the potential $V(x)$ may well take negative values, e.g. $b_* < 0$ for all $0 < \alpha < 1$. The equation $Hu = v$ admiits a Green function $G_H(x, y)$, the integral kernel of the operator $H^{-1}$. We obtain sharp lower- and upper bounds on the ratio of the functions $G_H(x, y)$ and $G_L(x, y)$. Examples illustrate our exposition.