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Some remarks about the Schrödinger operator with a particular singular complex potential. (Quelques remarques sur l'opérateur de Schrödinger avec un potentiel complexe singulier particulier.) (French) Zbl 1040.35017

Bull. Belg. Math. Soc. - Simon Stevin 9, No. 2, 293-298 (2002).

In this paper Schrödinger operators $S = -\Delta + V$ in \mathbb{R}^n are considered for which the sum in fact cannot be defined since $D(\Delta) \cap D(V) = \{0\}$. It is assumed that $V \in L^1(\mathbb{R}^N)$, $V \notin L^2_{\text{loc}}(\mathbb{R}^N)$ and $\text{Re}(V) > 0$ (if $N < 4$ this implies that S is defined only for $\{0\}$). The author studies extensions of S by using the form sum of $-\Delta$ and V . It is shown that for sufficiently large λ the equation $(-\Delta \oplus V)u + \lambda u = v$ with given $v \in L^2(\mathbb{R}^N)$ has a unique solution in $H^1(\mathbb{R}^N)$. For this a fixed point argument is used.

Reviewer: [Christiane Tretter \(Bremen\)](#)

MSC:

[35J10](#) Schrödinger operator, Schrödinger equation

[47B44](#) Linear accretive operators, dissipative operators, etc.

[81Q05](#) Closed and approximate solutions to the Schrödinger, Dirac, Klein-Gordon and other equations of quantum mechanics

Cited in 1 Document**Keywords:**

[Schrödinger operator](#); [complex potential](#); [singular potential](#)