

Delocalization for Schrödinger operators

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The phenomenon of localization, i.e. the appearance of intervals of dense point spectrum associated with exponentially decaying eigenfunctions, has become a popular topic in the spectral theory of Schrödinger operators. The antithetical event, namely isolated eigenvalues with long range eigenfunctions, is not so well-known. There are examples for the one-dimensional case which provide insight into the limitations of some theorems relating the behavior of eigensolutions at infinity to the spectrum. Such ideas have also been employed to show that Dirac operators with potentials tending to infinity may have holes in the essential spectrum. We will summarize these results and indicate possible approaches for higher dimensions.