Approximation of Schrödingeroperators by modified point interaction operators

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Abstract I shall report on a joint work with K.Ožanová, which is part of the project 'Convergence of Schrödinger Operators' supported by the 'European Research Council'.

Let H be a Schrödingeroperator in $L^2(\mathbb{R}^3)$ with electric potential μ from the generalized Kato class. Suppose that $\mu^{\pm}(\mathbb{R}^3) < \infty$. We give a sequence of operators H_n converging in the norm resolvent sense to H and such that the negative eigenvalues of the H_n can easily be computed numerically. In addition, we derive estimates for the speed of convergence. This can be used in order to derive estimates for the rate of convergence of the eigenvalues of the approximating operators H_n towards the corresponding eigenvalues of the Schrödingeroperator H.