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Solving the one-dimensional Schrodinger equation using a set of Daubechies wavelet scaling functions.

In this contribution basis sets derived from Daubechies wavelets scaling functions[1] are used to solve the one-dimensional Schrödinger equation on the interval $[-x_{\max} : x_{\max}]$. We present the results for a) the harmonic oscillator and b) the Morse potential as function of the number N of intervals. Double logarithmic fits of the energy error against N are also shown. Fast convergence is found. Finally further applications to the three-dimensional Schrödinger equation also with a view to density functional calculations are discussed.

References

- 1.Daubechies,I.(1988). *Orthonormal bases of compactly supported wavelets Communications on Pure and Applied Mathematics*, 41(7), 909-996

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