

This is a review text file submitted electronically to MR.

Reviewer: Znojil, Miloslav

Reviewer number:

Address:

NPI ASCR,
250 68 Rez,
Czech Republic
znojil@ujf.cas.cz

Author: Kelbert, E.; Hyder, A.; Demir, F.; Hlousek, Z. T.; Papp, Z.

Short title: Green's operator for Hamiltonians with Coulomb plus polynomial potentials.

MR Number: 2369975

Primary classification: 65F15

Secondary classification(s): 47B36 81Q05

Review text:

A variation on ref. [2] from 1975 based on a hidden change of variables in the underlying differential Schroedinger equation (made popular by Kustaanheimo, P., and Stiefel, E., in 1965 in J. Reine Angew. Mathematik 218, 204). More explicitly: The well known linear-algebraist's experience is used that the numerical inversion of many finite- or infinite-dimensional matrices $J(z)=z-H$ proves facilitated by their factorization into a product of an upper triangular and a lower triangular factor. It is known that for tridiagonal or block-tridiagonal $J(z)$ the factors can be defined in terms of the scalar- or matrix-valued continued fractions, respectively. In the text under consideration the authors specify H as a Hamiltonian and the inverse $J(z)$ as its Green's function. They demonstrate that for several simple illustrative numerical examples the reliability as well as the practical rate of convergence of the search for poles of the Green's function is simply marvelous.