

Abstract Submitted
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Solution of the Schroedinger Eq. containing a Perey-Buck non-locality GEORGE RAWITSCHER¹, Retired, JOSEPH POWER², University of Connecticut, MAHMOUD JAGHOUB, University of Jordan, Amman, Jordan — This type of nonlocality requires the solution of a differential-integral equation that is cumbersome to achieve with finite difference methods. We have developed two different methods that render the solution easy to obtain. One (1) transforms the equation into a corresponding Lippmann-Schwinger integral equation that is solved by a spectral Chebyshev expansion method [1]. The second (2) uses a finite element Galerkin approach, using discrete variable representation Lagrange basis functions in each partition with Gauss-Lobato support points [2]. Both methods agree to within $1:10^{-9}$ in the evaluation of a scattering problem and require a fraction of a second on a conventional desktop computer. We consider this a significant step forward in the consideration of nonlocalities.

[1] G. Rawitscher, Nucl. Phys. A 886, 1 (2012);

[2] T. N. Resigno and C. W. McCurdy, Phys. Rev. A 62, 032706 (2000).

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