Abstract Submitted
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Nonperturbative distorted-wave approach for asymptotic solutions of coupled-channel scattering problems[1] D. SHU, I. SIMBOTIN, R. CÔTÉ, University of Connecticut — We developed and implemented a numerical method using distorted waves for coupled-channel scattering problems. Solutions of the full problem are expressed as $\mathbf{F} = \mathbf{A}(r)f + \mathbf{B}(r)g$, where f and g are solutions of the single-channel problem including the full diagonal potential. The 'unperturbed' distorted-waves f and g are obtained using our newly developed scheme for Milne's phase-amplitude method. The differential equations for $\mathbf{A}(r)$ and $\mathbf{B}(r)$ are recast in the new variable $x = 1/r$, and are solved using a spectral integration method based on Chebyshev polynomials. Our approach takes advantage of the fact that Milne's phase and amplitude, as well as $\mathbf{A}(r)$ and $\mathbf{B}(r)$, are slowly varying functions. Moreover, the simple change of variable $x = 1/r$ allows one to take fully into account the infinite tail of the potentials in a very efficient way.

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