Abstract Submitted
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Supersymmetric phase-equivalent potentials for atoms in intense laser fields[1] J.V. HERNÁNDEZ, B.D. ESRY, J.R. Macdonald Laboratory, Kansas State University, Manhattan, Kansas 66503 — Our work tests the basic assumption of the single-active-electron approximation: that any model which reproduces the bound spectrum — and ideally also the scattering properties — should provide a good approximation to the entire multi- electron system. In particular, we use two distinct methods that reproduce the energetic properties of the original effective one-electron potential and still exactly remove the Pauli excluded states. The first is a close- coupling approach, and the second is a grid method that utilizes principles of supersymmetric quantum mechanics [1] to create a phase- equivalent potential that removes the unwanted states and exactly reproduces the scattering phase shifts at all energies [2]. Despite retaining all of the properties of the original effective potential, we find quantitative differences in the physical observables given by the two methods and discuss their origin. [1] E. Witten, Nuc. Phys. B **188**, 513 (1981). [2] D. Baye, Journal of Physics A **20**, 5529 (1987); R. D. Amado, Phys. Rev. A **37**, 2277 (1988); D. Baye and J. M. Sparenberg, Phys. Rev. Lett. **73**, 2789 (1994); E. Garrido, D. V. Fedorov, and A. S. Jensen, Nuc. Phys. A **650**, 247 (1999).

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