

Abstract Submitted
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Hydrogen and Helium atoms in strong magnetic fields¹ ANAND THIRUMALAI, JEREMY HEYL, University of British Columbia — The energy levels of hydrogen and helium atoms in strong magnetic fields are calculated in this study. The current work contains accurate estimates of the binding energies of the first few low-lying states of these systems that are improvements upon previous estimates. The methodology involves computing the eigenvalues and eigenvectors of the generalized two-dimensional Hartree-Fock partial differential equations for these one- and two-electron systems in a self-consistent manner. The method described herein is applicable to calculations of atomic structure in magnetic fields of arbitrary strength as it exploits the natural symmetries of the problem without assumptions of any basis functions for expressing the wave functions of the electrons or the commonly employed adiabatic approximation. The method is found to be readily extendable to systems with more than two electrons.

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