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Coulomb Energy of Single-Proton Halo Systems BIJAYA ACHARYA, DANIEL PHILLIPS, Ohio University — Halo nuclei have unusually large spatial extension because one or more nucleons are weakly bound to a "core." For a single-neutron halo, the behavior of the radial wave function, as well as its dependence on binding energy and angular momentum can be calculated using a square-well as a model for the nuclear potential [1]. This model facilitates predictions for experimental measurements of the radii, photodisintegration cross sections, etc of these halo systems. A similar square-well model can be employed for nuclei which have a single-proton halo, such as ^{17}F [2]. We have used such a model to compute the Coulomb energies of halo systems. We have done this both to all orders in the Coulomb potential, and in Born approximation. The dependence of the Coulomb energy on the "halo parameter," i.e. the ratio of the range of the nuclear potential to the size of the system, has been examined. This allows us to determine the range of this parameter where the Born approximation is an accurate way to compute the Coulomb energy in halo nuclei.

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