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Uncertainty Estimates for Bound States, Resonances, and Scattering of Light Ions[1] BENJAMIN LUNA, Tennessee Technological University, THOMAS PAPENBROCK, University of Tennessee — The low-energy structure of neutron halo nuclei is well understood using effective field theories with zero-range interactions. However, this approach yields inaccurate results at leading order for charged-particle halos. We propose instead to describe the low-energy structure of charged-particle halos through a finite-range interaction potential. We use a two parameter delta-shell potential plus the Coulomb potential and compute charge radii, asymptotic normalization coefficients, scattering lengths, effective ranges, and scattering phase shifts for ^{6}Li, ^{7}Li, ^{7}Be, ^{8}Be, and ^{17}F. We also make an attempt to estimate uncertainties due to the adjustment of parameters to data and systematic model uncertainties. Our results agree with data within uncertainties, and we make several predictions. This opens the way to compute S factors of astrophysically relevant reactions with uncertainties.

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