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Effect of varying charge and matter radii on observables in ⁶He and ⁸He¹ AZAMAT ORAZBAYEV, CHARLOTTE ELSTER, Ohio University, STEPHEN WEPPNER, Eckerd College — The helium isotopes ⁶He and ⁸He have total spin zero, but they are open-shell nuclei. Conventional microscopic optical potentials are derived for closed shell nuclei. When the ground state is assumed to have neutrons occupying the $p_{3/2}$ -shell, two additional terms need to be added to the microscopic optical potential. These terms modify the differential cross section and the analyzing power. Here we study the influence of charge and matter radii on the differential cross-section and on the analyzing power A_y . It is found that the analyzing power A_y is more sensitive to the variations of charge radii than the differential cross-section. The difference between the conventional and the modified microscopic optical potentials decreases at higher energies. This phenomenon is explained by the fact that the additional central and spin-orbit terms of the optical potential have the opposite effects on the observables. At higher energies, the magnitudes of these effects become approximately equal and the overall effect reduces. The study of varying matter radii shows the smaller sensitivity of the observables to this parameter. The effect of the valence neutrons on the observables is larger in ⁸He than in 6 He.

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