

Abstract Submitted
for the APR13 Meeting of
The American Physical Society

Microscopic Optical Potential for Scattering of ${}^6\text{He}$ and ${}^8\text{He}$ off Protons¹ CHARLOTTE ELSTER, AZAMAT ORAZBAYEV, Ohio University, STEPHEN WEPPNER, Eckerd College — The calculation and derivation of microscopic optical potentials for obtaining scattering observables for elastic scattering from spin-zero nuclei has a long tradition. So-called microscopic “folding” models based on a nuclear density matrix and a fully-off-shell two-nucleon t-matrix have been developed mainly for closed shell, heavy nuclei. Constructing a microscopic optical potential for the Helium isotopes poses the challenge, that they are not closed-shell nuclei. In addressing this challenge, the Watson optical potential has been extended to incorporate the open-shell structure of ${}^6\text{He}$ and ${}^8\text{He}$. This leads to additional contributions to the central and spin-orbit potential. Calculations based on an harmonic oscillator ansatz for the single-particle density matrix and the charge-dependent Bonn potential will be presented, and the effect of the additional terms on the differential cross section and the polarization will be discussed.

¹Supported by DOE under DE-FG02-93ER40756 and the TORUS collaboration.

Charlotte Elster
Ohio University

Date submitted: 11 Jan 2013

Electronic form version 1.4