^{208}Pb(^{13}O,^{13}O) 2022Wa16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, C. G. Sheu and J. E. Purcell	NDS 198,1 (2024)	1-Aug-2024

2022Wa16: XUNDL dataset compiled at TUNL (2022).

The authors measured elastic scattering of the ^{13}O and ^{13}B mirror nuclei on ^{208}Pb and analyzed the nuclear densities obtained from optical model analyses.

A beam of 413 MeV ^{13}O ions from the HIRFL in Lanzhou impinged on a 12.24 mg/cm^2 thick ^{208}Pb target. Scattered ^{13}O ions were momentum analyzed using an array of four position sensitive ΔE-E Si-detector telescopes that covered $\theta\approx3°$ to 27°. Differential cross sections were analyzed for θ_{lab}=4° to 15°. Only the ground state is bound in ^{13}O, and participation of any ^{208}Pb excited states was unresolved.

The data were analysed using two optical model approaches: first, using the double-folding Sao Paulo potential-2 (2021Ch70), and second using the single-folding Xu and Pang potential model (2013Xu06). The data are reasonably fit using standard global parameterization inputs. The discussion gives details on an approach for obtaining the proton, neutron and matter rms radii. A comparison of the results may suggest a thin proton skin for ^{13}O.

^{13}O Levels

E(level)	Comments
0	$<r_p^2>^{1/2}$=3.095 fm, $<r_n^2>^{1/2}$=2.670 fm, $<r_m^2>^{1/2}$=2.939 rm.