Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Spectroscopy of single-particle states in oxygen unstable isotopes via (pol p,2p) reaction SHOICHIRO KAWASE, CNS, University of Tokyo, SHARAQ04 COLLABORATION — The spin-orbit coupling has an important part in building the nuclear structure. It is so strong in nuclei, unlike atomic system, that it can shuffle the level sequences with different principal quantum numbers, or in different major shells. Our goal is to elucidate how the spin-orbit splitting, which is a direct measure of the strength of the spin-orbit coupling and is defined as a single-particle energy difference of spin-doublet, changes as a function of nucleon number in oxygen isotopes. To this end, the $(\vec{p},2p)$ reaction is an effective spectroscopic tool because of its property of selectively populating single-hole states. We performed $^{14,22-24}$O$(\vec{p},2p)$ reaction experiment with a polarized proton target at RIKEN RIBF to measure single-particle spectra and to determine the spin-orbit splitting in $^{14,22-24}$O. The beam consisting of unstable isotopes of oxygen at $\sim$250 A MeV bombarded the solid polarized proton target. Two scattered protons were detected by using a pair of detector units consisting of a plastic scintillator and a multi-wire drift chamber. Excitation energy for the residual nitrogen was obtained from the energies and the scattering angles of the protons. The details of the experiment and its result will be reported.

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Date submitted: 30 Jun 2014 Electronic form version 1.4