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Exclusiv one-nucleon removal from 14O at ˜100 MeV/nucleon

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One-nucleon removal reaction at intermediate energies has been a powerful tool for single-particle structure studies of exotic nuclei [1], but the reaction mechanism is not fully understood [2-5]. One debated phenomenon is the asymmetric parallel momentum distribution (PMD) of the residual nucleus occuring occasional in one nucleon removal induced from light ion-targets [4,6,7]. Recent theoretical calculation of (p,pN) reactions with ^{14}O at 100 MeV/nucleon with the distorted-wave impulse approximation (DWIA) predicted also large asymmetric PMD for deeply-bound nucleon removal [5]. The low momentum tail is found to be due to the attractive potential between the residues and the outgoing nucleons and the steep falloff on the high momentum side is due to the energy and momentum conservation. Still, comparison with experimental data is necessary for validation and will be a basis for further spectroscopic factor studies. We have performed ^{14}O(p,pN)^{13}O and ^{14}O(p,2p)^{13}N reactions at $\sim$100 MeV/nucleon with a thin solid hydrogen target at SAMURAI at RIKEN. Momentum of the residues were extracted from the SAMURAI spectrometer. Details of the data analysis and results of the cross section and PMD will be presented.

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Topic

Experiment

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