PROBING EFFECT OF TENSOR INTERACTIONS IN LIGHT NUCLEI VIA HIGH-MOMENTUM NEUTRON-TRANSFER REACTION

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We report supporting evidences for the effect of tensor interactions in ^{16}O via two separate measurements of high-momentum one-neutron transfer reactions, one at around 0 degree at the FRS in GSI, and another at 0 - 10 degrees at RCNP, Osaka University. The experiments were performed using proton beams at energies from 392 MeV to 1209 MeV. Previously, we have measured the reaction at energies up to 392 MeV and at finite angles between 10 - 25 degrees. However, the observed "enhanced high-momentum components" at these finite angles could have been falsely caused by reaction mechanisms, which may become important at these angles.

In the GSI (RCNP) experiment, we bombarded a POM (Mylar) target with proton beams. The scattered deuterons were momentum analyzed by the FRS (Grand Raiden spectrometer), operated in a momentum-dispersive mode, and detected at the focal plane. Missing-mass spectra for the residual ^{15}O nucleus were reconstructed using the measured momenta of the scattered deuterons. Measurements with ^{nat}C targets were also performed to subtract the contributions from the ^{12}C contaminant in the POM (Mylar) target. The results at around 400 MeV are consistent with the previous measurement at finite angles, indicating that the effect of reaction mechanisms is negligible. Although detailed data analyses for other energies are still in progress, we expect the results to be consistent with the measurements at finite angles. The present work, together with the earlier work, suggests possible observations of enhanced high-momentum neutrons due to the tensor interactions.