

Polarization measurement of polarized deuteron beam for deuteron-proton elastic scattering experiment/重陽子-陽子弾性散乱実験に向けた偏極重 陽子ビームの偏極度測定

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The three-nucleon force (3NF) is crucial for understanding various nuclear properties, including the binding energy of light nuclei and observables in few-nucleon scattering. In few-nucleon scattering, 3NF effects have been observed in the cross section for deuteron-proton elastic scattering at around 100 MeV/nucleon [1]. 3NF effects have been observed in the cross section for deuteron-proton elastic scattering at around 100 MeV/nucleon. Meanwhile, spin observables, e.g. deuteron analyzing powers, are not always described by the 3NF models. To investigate 3NFs, we extend measurements to the complete set of spin correlation coefficients for deuteron-proton scattering at 100 MeV/nucleon. These observables are obtained by using a polarized deuteron beam and a polarized proton target. In this study, we measured the polarization of the deuteron beam using a newly installed beamline polarimeter.

We conducted the experiments at the RIKEN RI Beam Factory. The polarized deuteron beam was accelerated by an AVF cyclotron up to 14 MeV. The polarimetry was made by using the reaction of $^{12}\text{C}(d, p)^{13}\text{C}_{\text{gnd}}$. [2]. The beam bombarded the polyethylene target with thickness of 10 μm . Scattered protons were detected by a dE-E detector consisting of a plastic scintillator and a NaI(Tl) detector.

In the conference, we report the experimental procedure and the obtained results.

References

- [1] K. Sekiguchi et al., Phys. Rev. C 65, 034003 (2002).
- [2] N. Sakamoto, Master thesis, University of Tokyo (1992).

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