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First measurements of the analyzing powers of the proton-deuteron break-up reaction at large proton scattering angles

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Polarization observables in the proton-deuteron break-up reaction are sensitive probes to investigate the spin structure of the nucleon-nucleon and three-nucleon forces. A measurement of the analyzing powers for the $2\text{H}(p,pp)n$ break-up reaction was carried out at KVI exploiting a polarized-proton beam produced in an atomic-beam type polarized ion source [1] at a proton-beam energy of 135 MeV. The scattering angles and energies of the final-state protons were measured using the Big Instrument for Nuclear-polarization Analysis (BINA) [2] with a nearly 4π geometrical acceptance. In this work, we extended the earlier measurements [3] that were done for kinematical configurations at small proton scattering angles by analyzing configurations at which one of the final-state protons scatters towards the backward part of BINA. The results are compared with theoretical calculations based on NN potential alone or combined with the 3N potential, with or without the inclusion of the Coulomb effect. Discrepancies between polarization data and theoretical predictions are observed for configurations corresponding to small relative azimuthal angles between the two final-state protons. These configurations show a large sensitivity to 3N force effects. In this contribution, some of these configurations along with the analysis method will be discussed.

References

- [1] H. R. Kremers and A. G. Drentje, AIP Conf. Proc. 421, 502 (1997).
- [2] A. Ramazani-Moghaddam-Arani, H. R. Amir-Ahmadi, A. D. Bacher, C. D. Bailey, A. Biegun, M. Eslami-Kalantari, I. Gapari, L. Joulaeizadeh, N. Kalantar-Nayestanaki, St. Kistryn, A. Kozela, H. Mardanpour, J. G. Messchendorp, A. M. Micherdzinska, H. Moeini, S. V. Shende, E. Stephan, E. J. Stephenson, and R. Sworst, Phys. Rev. C 78, 014006 (2008).
- [3] N. Kalantar-Nayestanaki, E. Epelbaum, J. G. Messchendorp and A. Nogga, Rep. Prog. Phys. 75, 016301 (2012).

Selected session

Few-Body Systems

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