

Dynamics of three-nucleon systems at 100 MeV

The dynamics of the three-nucleon system can be very extensively tested by means of the deuteron-proton breakup reaction. Experimental studies of the dp system expose various dynamical ingredients, like three-nucleon force (3NF) and Coulomb force, which play an important role in correct description of observables (e.g. cross section). It is worth to underline that experiments with polarized beams (or targets) give opportunity to study a large number of observables sensitive to various dynamical components, which are hidden in the unpolarized case. All studied observables (e.g. vector and tensor analyzing powers [1]) are interesting for testing theoretical calculations based on various approaches [2 - 5] to model the interaction in three-nucleon systems. Moreover, studies of the dp breakup reaction at low energy are very crucial for testing The Chiral Perturbation Theory [6] (calculations for the nucleon-deuteron breakup reaction at low energies will be available soon).

The presentation will concentrate on testing the 3NF and the Coulomb force effects for the differential cross section of the $^1\text{H}(d, pp)n$ reaction at beam energy of 100 MeV. The experiment was performed at KVI in Groningen, with the use of the BINA detector [1,7].

- [1] E. Stephan, et al., Eur. Phys. J. A 49 (2013) 36.
- [2] H. Witała, et al., Phys. Rev. Lett. 81 (1998) 1183.
- [3] A. Deltuva, et al., Phys. Rev. C 68 (2003) 024005.
- [4] S.A. Coon, et al., Few-Body Syst. 30 (2001) 131.
- [5] A. Deltuva, et al., Phys. Rev. C 80 (2009) 064002.
- [6] E. Epelbaum, et al., Eur. Phys. J. A 19 (2004) 125; *ibid.* A 19 (2004) 405.
- [7] N. Kalantar-Nayestanaki et al., Rep. Progr. Phys. 75 (2012) 016301.

Author: SKWIRA-CHALOT, Izabela (Faculty of Physics University of Warsaw)

Co-authors: KALANTAR-NAYESTANAKI, Nasser (University of Groningen); KISTRYN, Stanislaw (Jagiellonian University); KOZELA, Adam (Polish Academy of Science); STEPHAN, Elżbieta (University of Silesia)

Presenter: SKWIRA-CHALOT, Izabela (Faculty of Physics University of Warsaw)

Session Classification: Will not participate

Track Classification: Section 2. Experimental and theoretical studies of nuclear reactions.