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Experimental studies of few-nucleon systems

Thursday, 26 September 2024 15:10 (20 minutes)

The dynamics of the three-nucleon system can be extensively studied in the deuteron-proton (dp) breakup reaction. Experimental studies of the dp system allow for the observation of effects of various dynamical components, such as three-nucleon force (3NF) and Coulomb force. Measurements of cross sections as well as polarized observables (e.g. vector and tensor analyzing powers [1]) allow testing theoretical calculations based on various approaches [2 - 5] to model the interaction in three-nucleon systems. Additionally, studies of the ^{1}H(d, pp)n reaction at low energy (e.g. 50 MeV/nucleon) are essential for testing predictions of Chiral Effective Field Theory (ChEFT) [6].
The presentation will focus on the effects of the 3NF and the Coulomb force in the differential cross section of the dp breakup reaction measured in the wide range of energies between 50 and 170 MeV/nucleon [8 - 11]. The data collected at 50 MeV/nucleon will be compared to predictions of ChEFT [7]. Furthermore, there will be information about the ongoing and planned projects conducted at the Cyclotron Center Bronowice, PAS, Kraków, Poland.

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

Co-authors: Prof. KALANTAR-NAYESTANAKI, Nasser (ESRIG, University of Groningen, 9747 AG Groningen, The Netherlands); KISTRYN, Stanisław (Jagiellonian University); KOZELA, Adam (Institute of Nuclear Physics, Polish Academy of Sciences, 31342 Kraków, Poland); STEPHAN, Elżbieta (Institute of Physics, University of Silesia, 41500 Chorzów, Poland)

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

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