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Differential Cross Section for Proton Induced Deuteron Breakup at 108 MeV

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Studies of few-nucleon system dynamics is the basis for understanding of nuclear interactions and properties of nuclei.
The very accurate theoretical calculations for three nucleon systems should be confronted with a rich set of systematic experimental data. For this purpose a series of measurements of deuteron breakup in collision with proton was conducted in KVI Groningen and FZ-Julich. These studies confirmed the important role of the Three-Nucleon Force (3NF) and huge influence of Coulomb interaction between protons [1-3]. However, some discrepancies persist, indicating that our present understanding of the problem is not yet perfect [4-6]. The origin of the discrepancies is not known. At intermediate energies, they can be possibly attributed to deficiencies of current 3NF models or to lack of fully relativistic calculations. Continuation of the studies in a wide range of energies, at the regions of the maximum visibility of the certain effects, are necessary. For this purpose, the BINA (Big Instrument for Nuclear-polarization Analysis) detection system has been installed at CCB (Cyclotron Center Bronowice).
The BINA setup is designed to study the elastic and breakup reactions at intermediate energies. It consist of the liquid target facility and the low threshold detector covering nearly 4π solid angle, enabling studies of almost full phase space of these reactions [4,7].
The data analysis and results of the first experimental run of proton-induced deuteron breakup at beam energy of 108 MeV performed at Cyclotron Center Bronowice PAS in Cracow will be presented. Differential cross section determined for a set of kinematic configurations will be compared to state of the art theoretical calculations.

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