

# INCOHERENT NEUTRAL PION PHOTOPRODUCTION ON THE TENSOR-POLARIZED DEUTERON AT VEPP-3

*Wednesday, 13 July 2022 10:20 (20 minutes)*

The results of measurement of the T20 component tensor analyzing powers in incoherent  $\pi^0$ -meson photoproduction on the deuteron in the proton energy range of 50–150 MeV are presented. Experimental statistics of the reaction under study was isolated from the experiment that was designed to investigate coherent neutral pion photoproduction on deuteron [1-3]. In this experiment, protons and two photons were recorded by the upper and lower arms of the detecting system, respectively. The measured asymmetries of the yields with regard to the change in the sign of tensor polarization of deuterons were used to calculate the T20 component of the tensor analyzing power of the reaction under investigation. A detailed description of the experimental setup and detection equipment is provided in [1- 3].

The obtained experimental data are compared with the results of statistical simulation. The event generation was followed by verification that it belongs to the permissible region of the kinematic phase space. After the generation of independent kinematic variables, the reaction amplitude was calculated. The model described in [4] was used to calculate the amplitude of the neutral pion photoproduction. In the framework of the model, the quasi-free pion photoproduction on nucleons that form the deuteron and the contribution of nucleon-nucleon and pion-nucleon rescattering were considered. The measurements cover the photon energy range of (300-600) MeV. In general, there is a qualitative agreement between experimental and available theoretical predictions. It is planned to give further attention to extraction of the experimental data on the reaction from the experimental statistics accumulated at VEPP-3 in 2021 using the photon tagging system.

1. Rachek I.A. et al. // Few-Body Syst. 2017. V. 58. P. 28
2. Gauzshtein V.V. et al. // European Physical Journal A. 2020. V.56. P.169.
3. Gauzshtein V.V. et al. // Modern Physics Letters A. 2021. V. 36. P. 2150199
4. Fix A., Arenhövel H. // Phys. Rev. C. 2005. V. 72. P. 064005.

## **The speaker is a student or young scientist**

No

## **Section**

1. Nuclear structure: theory and experiment

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