Contribution ID: **24**   Type: **Poster**

The Monte Carlo simulation of MiniSPD stand

Friday 8 July 2022 11:15 (45 minutes)

The Spin Physics Detector, a universal facility for studying the nucleon spin structure and other spin-related phenomena with polarized proton and deuteron beams. It will be placed in one of the two interaction points of the NICA collider that is under construction at the Joint Institute for Nuclear Research (Dubna, Russia). The main objective of the proposed experiment is the comprehensive study of the unpolarized and polarized gluon content of the nucleon.

In accordance with the possible configuration of the SPD setup, our collaboration manufactured the Min-iSPD stand. At present, this stand is used for testing SPD detector prototypes with cosmic muons, the Data Acquisition System (DAQ) and the Detector Control System (DCS).

Using GEANT4 software and ROOT framework, we have been carried out Monte Carlo simulation of three modules of two-sided silicon plates of MiniSPD stand for two cases: with and without taking into account operation of the scintillator triggers. We illustrate the solution of the alignment task which is the important part of any experiment. Our simulation silicon detectors are agreed well with experimental data on cosmic muons.

We are currently engaged in modeling and processing experimental data at the MiniSPD stand, so this device does not involve the use of machine learning methods. But when there is a transition to a full SPD installation, when processing data, machine learning methods will be needed and with our performance we would like to interest and attract specialists from this field.

Agreement to place

Participants agree to post their abstracts and presentations online at the workshop website. All materials will be placed in the form in which they were provided by the authors

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Session Classification: Posters