

The use of new methods for processing data of a physical experiment.
Application of machine learning methods on the NICA complex.

Contribution ID: 10

Type: **not specified**

Neutron reconstruction in the highly granular time-of-flight neutron detector at the BM@N experiment.

Tuesday, August 29, 2023 3:00 PM (30 minutes)

The compact highly granular time-of-flight neutron detector (HGN) is designed for the fixed target BM@N experiment at the NICA facility. This detector is aimed to measure anisotropy of azimuthal neutron flows, that are sensitive to the equation of state for dense nuclear matter. Neutrons are produced in nucleus-nucleus collisions with energies up to several GeV. The main reconstruction challenge is to deal with high background rates, that are expected in the detector acceptance. In this contribution we propose two machine learning models for neutron reconstruction: based on boosted decision tree (BDT) and graph neural network (GNN). Strong and weak points of BDT and GNN approaches will be discussed. Reconstruction performance of both models is evaluated on simulations in the full BM@N detector environment.

Primary author: BOCHARNIKOV, Vladimir (HSE University)

Presenter: BOCHARNIKOV, Vladimir (HSE University)