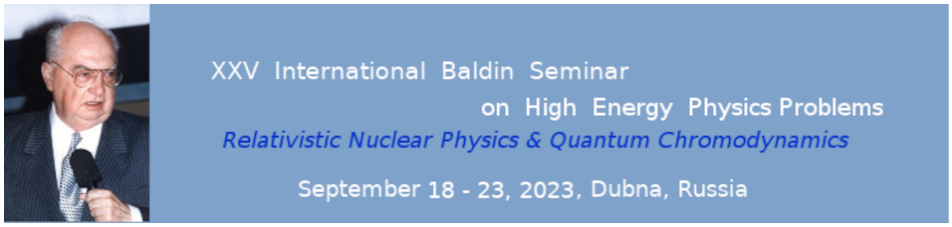

Contribution ID: **48** Type: **not specified**

Development of the Vector Finder toolkit for track reconstruction in the BM@N experiment

Thursday, 21 September 2023 14:50 (20 minutes)

Baryonic Matter at the Nuclotron (BM@N) at the NICA complex is a fixed target experiment to study quantum chromodynamic (QCD) phase diagram at large baryon-chemical potential. To extract quality physics information it requires efficient and reliable event reconstruction methods in the conditions of high-multiplicity environment.

Track finding is in the core of event reconstruction methods of any heavy-ion experiment. At BM@N, it is based on a constrained combinatorial search for track candidates, i.e. combinations of detector hits possibly belonging to a track. Possible track candidates are created starting from 3-hit combinations, which are extended from the first detector station and fitted with a Kalman filter procedure to exclude low quality track candidates with high ^{2}-value.

The algorithm has been implemented as a Vector Finder software toolkit containing track reconstruction procedures and tools to define hit acceptance windows (a priori constraints) for the track search. The method as well as possible constraints for track finding are presented in the talk.
Track reconstruction results for simulated events of heavy-ion interactions are shown demonstrating the performance of the approach proposed.

Primary author: ZINCHENKO, Dmitry (JINR)

Co-authors: NIKONOV, Eduard (LIT JINR); ZINCHENKO, Alexander (Joint Institute for Nuclear Research); Mr ZINCHENKO, Roman (Physics Department, Moscow State University)

Presenter: ZINCHENKO, Dmitry (JINR)

Session Classification: Parallel: Project NICA/MPD/SPD at JINR