

XXV International Baldin Seminar on High Energy Physics Problems  
"Relativistic Nuclear Physics and Quantum Chromodynamics"



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*Relativistic Nuclear Physics & Quantum Chromodynamics*

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## Centrality determination method based on observables from TPC and FHCAL at MPD/NICA

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The MPD NICA experiment, which will study heavy-ion collisions at energies of  $\sqrt{S_{NN}} = 4 - 11$  GeV, is currently under construction at JINR, Dubna. To date, several methods have been developed to determine centrality of heavy-ion collisions. One of the approaches is relied on the spatial energy distributions in Forward Hadron Calorimeters (FHCAL) modules. The other method is the commonly used approach of collision centrality determination based on track multiplicity from a Time-Projection Chamber (TPC). Both approaches have their own advantages and drawbacks. This work presents the preliminary results of a new centrality determination method development that relies on both observables from FHCAL and TPC. The method provides the ability to determine centrality classes from 3D-correlation of observables from FHCAL and TPC. This correlation of track multiplicity in TPC and energy distributions in FHCAL and subsequent division of events into centrality classes provide better centrality resolution especially for central collisions. In addition, the presented approach provides a basis to relate the energy deposition in the calorimeter to the Glauber model.

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