Contribution ID: **1215**   Type: **Oral**

Methods for centrality determination in heavy-ion collisions

Wednesday 1 November 2023 17:10 (15 minutes)

The size and evolution of the matter created in a relativistic heavy-ion collision strongly depend on the collision's initial geometry, defined by centrality. Experimentally the centrality of collisions can be characterized by the measured multiplicities of the produced particles at midrapidity or by the energy measured in the forward rapidity region, which is sensitive to the spectator fragments. We will propose the procedure for centrality determination based on Monte-Carlo sampling of spectator fragments. The validity of the procedure has been checked using the fully reconstructed DCM-QGSM-SMM model events and published data from the NA61/SHINE experiment. Also, we will discuss the prospects of using the proposed procedure for centrality determination in the BM@N and MPD experiments at the NICA facility.

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Session Classification: High Energy Physics

Track Classification: High Energy Physics