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Physics with spectators in MPD/NICA experiment

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At present the heavy ion accelerator complex NICA is under construction in Dubna, Russia. The Multi-Purpose Detectors (MPD) will operate at NICA to study the properties and phase diagram of strongly interacting matter. The Forward Hadron Calorimeter (FHCal) is one of the basic sub-detectors of MPD and is intended for the detection of the particles in very forward rapidity region, mainly, non-interacting projectile fragments (spectators). Since the FHCal has a beam hole, most of the bound spectators escape in this hole, while the free spectators (protons and neutrons) deposit their energy in calorimeter. Experimental study of energy and space distributions of the spectators could provide an important information about the geometry of the heavy-ion collisions, namely, the centrality and the reaction plane orientation. Also, the angular distributions of the spectators can carry the information about the transverse momentum obtained from the collision region.
In this report the simulation results of the energy and space distributions of spectators in FHCal are presented. The approaches for the measurements of the collision centrality and the reaction plane orientation are discussed. It would be shown that the measurement of the spectators with forward calorimeter has a spectrum of the important physical tasks.
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