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## Approaches in centrality measurements of heavy ion collisions with forward calorimeters at MPD/NICA facility

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The MPD/NICA heavy ion experiment is now under construction in Dubna, Russia. The centrality is the global characteristic of the nuclear interaction that reflects the degree of the nuclei overlapping or the number of interacting nucleons. One of methods to measure the centrality is the determination of the number of non-interacting projectile fragments or spectators, which have the very forward/backward rapidity. In MPD setup these spectators would be detected by the two identical hadron calorimeters placed at the opposite sides of the beam interaction point. Both forward hadron calorimeters (FHCAL) have the central holes for the beam pipe. The most of heavy fragments escape in these beam holes and are not detected by the calorimeters. As a consequence, the central and peripheral collisions have the same spectator's energy depositions that leads to the ambiguity in the determination of the collision centrality. To resolve this ambiguity a few approaches are developed based on the Monte-Carlo simulations with a fragmentation models. In first approach, the transverse and longitudinal components of the energy depositions in calorimeters are calculated. These two energy components have different correlations for central and peripheral event and can be used for the measurements of the collision centrality. The second approach is based on the subtraction of the pion contamination in FHCAL. The number of produced pions is the maximum in the central events and it is minimum in the peripheral ones. The pion energy fraction in FHCAL can be subtracted to accurately measure the spectator's energy in calorimeters. The accuracy of the centrality measurements with these methods is discussed.

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