

Monte Carlo models validation for the FHCAL calorimeter response simulation in the MPD NICA experiment.

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To simulate the forward hadron calorimeter (FHCAL) response, in the future MPD/NICA experiment two Monte Carlo generators DCM-SMM and PHQMD with two variants of cluster detection (MST and SACA) for the last one are used. Monte Carlo simulations are crucial in developing methods for centrality and orientation of the reaction plane determination with FHCAL. We present an experimental verification for a beam momentum of 30A GeV/c, comparing models and experimental Pb-Pb data obtained on the Projectile Spectators Detector (PSD) of the NA61 CERN experiment. PSD is similar to FHCAL and has a similar configuration, excluding the hole in the centre. Two comparisons of experimental and Monte Carlo data are presented, in the first case the data are compared in a complete calorimeter configuration, in the second case an artificial hole in the centre of the calorimeter is made to approximate the data to the FHCAL configuration. A good agreement of the DCM-SMM model with the experimental data is shown. For a configuration with an artificial hole modification of the PSD calorimeter DCM-SMM shows dramatically better performance.

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