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BOOK OF ABSTRACTS

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APPLICATION OF EPOS4 AND URQMD (LHC) EVENT GENERATORS TO ANALYSE 7 TeV pp COLLISIONS

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In the study of heavy ion collisions, pp collision modeling plays an important role. We have carried out modeling of 7 TeV pp collisions using the EPOS4 [1] and UrQMD [2] event generators (LHC).

We found that both baryon and lepton charges B and L, as well as energy, are conserved when simulating scattering events using UrQMD. However, there is a small non-conservation of the electric charge, and there is a significant deviation in the distribution of events by the number of outgoing charged particles from that experimentally obtained at the ALICE detector [3].

We found that the EPOS4 simulation results show noticeable tails in the distributions of B-L, electric charge Q, and energy. With a number of generated events of several thousand, the EPOS4 generator poorly describes the multiplicity distribution of charged particles. With a sufficiently large number of events (about 20 thousand) the generator gives a distribution of events by the number of outgoing charged particles close to that observed experimentally at the ALICE detector [3]. For UrQMD generator, increasing the number of generated events to the same value did not improve the distribution.

Discarding events in which conservation laws do not hold significantly worsens the multiplicity distribution for both generators. Therefore, such filtering is impractical.

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2. S. A. Bass, M. Belkacem, M. Bleicher, et al. Microscopic Models for Ultrarelativistic Heavy Ion Collisions Prog. Part. Nucl. Phys. 1998, 41, p. 225-370.

3. Adam, J., Adamová, D., Aggarwal, M.M. et al. Charged-particle multiplicities in proton–proton collisions at to to 8 TeV. Eur. Phys. J. C 2017, 77, 33.