

Charged Multiplicity Density and Number of Participant Nucleons in Relativistic Nuclear Collisions

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Abstract: The energy and centrality dependencies of charged particle pseudorapidity density in relativistic nuclear collisions were studied using a hadron and string cascade model, JPCIAE. Both the relativistic $p\bar{p}$ experimental data and the PHOBOS and PHENIX Au+Au data at RHIC energy could be fairly reproduced within the framework of JPCIAE model and without retuning the model parameters. The predictions for Pb+Pb collisions at the LHC energy were also given. We computed the participant nucleon distributions using different methods. It was found that the number of participant nucleons is not a well defined variable both experimentally and theoretically. Thus it may be inappropriate to use the charged particle pseudorapidity density per participant pair as a function of the number of participant nucleons for distinguishing various theoretical models.

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Key words: charged multiplicity, pseudorapidity density, number of participant nucleons, string fragmentation, JPCIAE model

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