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New results on Coulomb interaction effects in relativistic heavy ion collisions

The effects of the Coulomb interaction on charged pion production in heavy-ion collisions at RHIC-BES energies are investigated. From the pion transverse momentum spectra measured with STAR experiment, the negative-to-positive pion ratios as a function of transverse momentum are obtained and used to analyze the Coulomb final state interaction between the charged pions and the positive net-charge of the particle source. The “coulomb kick”(a momentum change due to Coulomb interaction) and initial pion ratio for three different collision energies (7.7, 11.5 and 19.6 GeV) and various centrality classes were obtained. The Coulomb kick shows a decrease with the increase of beam energy and a clear centrality dependence, with largest values for the most central collisions. These results are connected with the kinetic freeze-out dynamics.

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