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Centrality dependencies of charged pion production in 12C+12C collisions at 4.2 GeV/c per nucleon

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The dependencies of the average kinematical characteristics of the negative and positive pions, produced in 12C+12C collisions at 4.2 A GeV/c, on the collision centrality have been investigated. The number of the produced negative pions per participant nucleon of a projectile 12C nucleus, the average inelasticity coefficients of π−mesons, and the shapes of their full and transverse momentum distributions do not depend on 12C+12C collision centrality. The number of the produced positive pions per participant nucleon of a projectile carbon-12 nucleus, the average values of the inelasticity coefficient, full, longitudinal and transverse momenta of π+ mesons have decreased with increasing the collision centrality. The observed dependencies of the characteristics of the π− and π+ mesons on the collision centrality have been interpreted as due to the used centrality selection criterion, based on the number of participant protons, and conservation of the baryon number and electrical charge in a collision event. The obtained results can be useful for analysis of the high energy heavy ion collisions in order to subtract the effects purely due to the collision centrality selection method, based on the number of participant protons, and conservation of the baryon number and electrical charge in a collision event.

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