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Elliptic flow for π⁰ mesons in asymmetric Cu+Au collision system at √s_{NN}=200 GeV

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Quark-gluon plasma (QGP) is a state of nuclear matter, where quarks and gluons are deconfined [1]. It can be formed in laboratory conditions in collisions of heavy ions at high energies [2]. Elliptic flow (v₂), which reflects azimuthal anisotropy of hadron production in heavy ion collisions, is one of the main observables characterizing properties of QGP [3]. The study of the elliptic flow in relativistic heavy ion collisions (Cu+Cu and Au+Au) leads to the assumption that the QGP behaves as a nearly inviscid fluid [4]. The measurements of the v₂ in Cu+Au asymmetric collision system allow to determine the dependence of the elliptic flow for light hadrons on the initial geometry of the system [5]. Since π⁰ meson consists of the first-generation quarks (u, d), its production is well-measurable up to high values of p_T. Thus, the measurement of π⁰ meson v₂ in Cu+Au collisions is considered as an effective tool to study QGP's properties.
In symmetric collision systems such as Cu+Cu and Au+Au the scaling of elliptic flow values v₂ for π⁰ mesons with the participant nucleon eccentricity (ε₂) and with the third root of the number of participant nucleons (N_{part}^{1/3}) in all centrality classes was observed [6]. Such scaling could be interpreted in the frame of relativistic hydrodynamic model, considering QGP formation [7]. The observation of ε₂ N_{part}^{1/3} scaling in asymmetric Cu+Au collision system could lead to a conclusion that v₂/(ε₂ N_{part}^{1/3}) values for π⁰ mesons do not depend on the initial geometry of the system. Current report presents the study of the elliptic flow for π⁰ mesons in asymmetric Cu+Au collisions at √s_{NN}=200 GeV versus transverse momentum and centrality of the collision.
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The speaker is a student or young scientist

Yes

Section

1. Intermediate and high energies, heavy ion collisions

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