

Beam energy dependence of deuteron and anti-deuteron productions in Au+Au collisions at RHIC

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Light nuclei have much smaller binding energy compared to the temperature of the system. Consequently, their distributions can be used to probe the freeze-out properties, such as correlation volume and local baryon density of the medium created in high-energy nuclear collisions.

In this talk, we report the results of deuteron and anti-deuteron production in Au-Au collision at $\sqrt{s_{NN}} = 7.7-200$ GeV, measured by STAR at RHIC. The collision energy, centrality and transverse momentum dependence of the coalescence parameter B_2 for deuteron and anti-deuteron production is discussed. We find the values of B_2 for anti-deuteron are systematically lower than those for deuterons. The difference in B_2 for deuteron and anti-deuteron indicate the residual isospin brought in at the beginning of the collisions. The values of B_2 are found to decrease with increasing collision energy. The rate of decreasing seems to change around $\sqrt{s_{NN}} = 20$ GeV implying a dramatic change of the equation of state of the medium in these collisions.

Preferred Track

Baryon-Rich QCD Matter and Astrophysics

Collaboration

STAR

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