Nuclear Modification Factors in d+Au and Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV

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In order to explore the nuclear medium created in relativistic heavy ion collisions, the nuclear modification factor, which is defined as the inclusive transverse momentum (p_T) spectra of particles from A+B collisions with respect to p+p interactions scaled by the number of binary collisions,

$$R_{AB} = \frac{d^2N^{AB}/dp_T dy}{< N_{bin} > \times d^2N^{pp}_{inel}/dp_T dy}, \quad (1)$$

has been studied for various systems. The enhancement or suppression of the nuclear modification factor, reflects various initial and final state effects, such as the Cronin effect, nuclear shadowing and gluon saturation. The centrality and rapidity dependences of the nuclear modification factor R_{AuAu} in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV will be discussed. The rapidity dependence of R_{dAu} for identified particles at RHIC energy $\sqrt{s_{NN}} = 200$ GeV, provides a clean probe to disentangle different aspects of the collision dynamics, such as parton saturation and multiple parton scattering at the initial stage of the collision and the final state effects.

Particle ratios like K/π as well as the like-particle ratios at different rapidities provide insight into the hadro-chemistry of the system. The net-proton distributions are instructive for understanding the collision scenario, e.g. the baryon transport mechanism. The p_T spectra of identified hadrons have been fitted to power-law, exponential in m_T and Boltzmann functions for pions, kaons and protons respectively. The rapidity dependence of the integrated yields and the ratios will be shown and compared to model expectations.