



Contribution ID: 236

Type: Poster

Energy dependence of transverse momentum fluctuations in Au–Au collisions from a multiphase transport model

We extensively investigate the mean transverse momentum fluctuations concerning centrality and energy dependences in Au–Au collisions at 3.0–19.6 GeV using a multiphase transport (AMPT) model. Inspired by prior research, we have adjusted the key parameter, the Lund string fragmentation parameter b_L , to manifest an approximately linear dependence on the impact parameter. Consequently, the mean transverse momentum $\langle p_T \rangle$ appropriately demonstrates a dependence on centrality classes. In addition, the dependence of b_L on the impact parameter systematically increases with rising beam energy. This adjustment enables the AMPT model to reasonably describe the energy dependence of mean transverse momentum $\langle p_T \rangle$. The improved AMPT provides a reliable platform to calculate p_T fluctuations by qualitatively describing the data production of π^\pm in 0–5% centrality around midrapidity ($|y| < 0.1$) at available incident energies. In line with previous findings, power-law dependences of p_T cumulants of all orders on collision centrality N_{part} are observed at higher energies. Furthermore, the scaled cumulants normalized by the mean $\langle p_T \rangle$ are computed, and the corresponding variances align well with the trends observed in experimental measurements. Then, the scaled cumulants also are applied using two subevent methods, where the component of short-range correlation is suppressed compared to the calculations performed using the standard method. Our cumulant method exhibits a robust framework for investigating high-order transverse momentum fluctuations.

Category

Theory

Collaboration (if applicable)

Author: Dr ZHANG, Liuyao (Fudan University (CN))**Co-authors:** Dr ZHANG, Chunjian (Fudan University (CN)); Prof. CHEN, Jinhui (Fudan University (CN))**Presenter:** Dr ZHANG, Liuyao (Fudan University (CN))**Session Classification:** Poster session 1**Track Classification:** Correlations & fluctuations