第二十届全国中高能核物理大会暨第十四届全国中高能核物理专题研讨会

Contribution ID: 2

Type: **口头报告** 

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

Sunday, 27 April 2025 11:55 (20 minutes)

Event-by-event mean transverse momentum fluctuations ( $p_{\rm T}$ ) serve as a sensitive probe of initial state overlap geometry and energy density fluctuations in relativistic heavy-ion collisions. We present a systematic investigation of  $p_{\rm T}$  fluctuations in Au+Au collisions at  $\sqrt{s_{\rm NN}} = 3.0-19.6$  GeV, examining their centrality and energy dependence with the framework of an improved multiphase transport (AMPT) model. The centrality dependence of the  $p_{\rm T}$  cumulants up to fourth order deviates significantly from simple powering-law scaling. Scaled cumulants are performed, with variances aligning well with the trends observed in the experimental data. Employing a two-subevent method, short-range correlations are slightly suppressed compared to the standard approach. Furthermore, baryons exhibit more pronounced  $\langle p_{\rm T} \rangle$  fluctuations than mesons, potentially attributable to the effect of radial flow. These results provide referenced insights into the role of initial state fluctuations across different energies in heavy-ion collisions.

Please see the details using the DOI: https://doi.org/10.1103/PhysRevC.111.024911.

**Primary author:** Dr ZHANG, Liuyao (Institute of Nuclear Science and Technology, Henan Academy of Sciences)

Co-authors: Prof. CHEN, Jinhui; Prof. ZHANG, Chunjian

Presenter: Dr ZHANG, Liuyao (Institute of Nuclear Science and Technology, Henan Academy of Sciences)

Session Classification: 分会场三