

Transverse momentum dynamics in Au+Au collisions from the STAR experiment

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1 The study of event-by-event transverse momentum (p_T) fluctuations and p_T correlations
2 between particles provide insight into the properties of the hot and dense matter created
3 in Au+Au collisions at the Relativistic Heavy-Ion Collider (RHIC) spanning a wide range of
4 collision energies. These measures have been proposed as tools to understand the initial state
5 geometry and subsequent evolution of the system as well as quantify some of the thermody-
6 namic properties. As the $\langle p_T \rangle$ fluctuation is related to the specific heat of the system,
7 its study as a function of collision energy and centrality may demonstrate the onset of phase
8 transition and help in probing the QCD critical point.

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10 In this talk, we present the first results on the efficiency corrected charged particle event-
11 by-event $\langle p_T \rangle$ fluctuations and 2-particle p_T correlations as measured by the STAR col-
12 laboration in the STAR-FXT program. The results from central Au+Au collisions at $\sqrt{s_{NN}}$
13 = 3.0 GeV are compared with previous measurements of CERES at the Super Proton Syn-
14 chrotron and from ALICE at the Large Hadron Collider. The comparison of the experimental
15 results with transport model calculations and the effect of primordial protons on the results
16 will also be presented.