p_T fluctuations and correlations in 3.0 GeV fixed-target collisions from the STAR experiment

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The study of event-by-event transverse momentum (p_T) fluctuations and their correlations provide insight into the properties of the hot and dense matter created in Au+Au collisions at the Relativistic Heavy-Ion Collier (RHIC) spanning a wide range of collision energies. These measures have been proposed as tools to understand the initial state geometry and subsequent evolution of the system as well as quantify some of the thermodynamic properties. As the $< p_T >$ fluctuation is related to the specific heat of the system, its study as a function of collision energy and centrality may demonstrate the onset of phase transition and help in probing the QCD critical point.

In this talk, we present the first results on the efficiency corrected charged particle event-by-event mean p_T fluctuations and 2-particle correlations as measured by the STAR collaboration in the STAR-FXT program. The results from central Au+Au collisions at $\sqrt{s_{NN}} = 3.0$ GeV are compared with previous measurements of CERES at the Super Proton Synchrotron and from ALICE at the Large Hadron Collider. We also investigate the effects of the asymmetric acceptance of the STAR detector at 3.0 GeV. The comparison of the experimental results with transport model calculations and the effect of primordial protons on the results will be presented.