

# Higher-Order Moments of Net-Proton, Net-Charge and Net-Kaon Multiplicity Distributions in Cu+Cu Collisions at $\sqrt{s_{NN}} = 22.4, 62.4$ and 200 GeV from STAR

Zhenzhen Yang (for the STAR Collaboration)

Central China Normal University  
Lawrence Berkeley National Laboratory

Fluctuations of conserved charges (B, Q, S) are sensitive observables to explore the QCD phase structures in heavy-ion collisions. The STAR experiment has reported the energy dependence of the cumulants of net proton, net charge and net kaon distributions in Au+Au collisions at RHIC. Non-monotonic energy dependence has been observed in the net proton fluctuations in the most central (0-5%) Au+Au collisions for the energies in the RHIC beam energy scan. In a smaller colliding system, the final freeze out of the hot QCD matter is closer to the phase boundary, including QCD critical point compared to larger systems.

In this poster, we will report the collision energy and centrality dependence of higher-order moments of net proton, net charge and net kaon for Cu+Cu collisions at  $\sqrt{s_{NN}} = 22.4, 62.4$  and 200 GeV measured by the STAR experiment at RHIC. In addition, we will compare the results of Cu+Cu collisions to that of Au+Au collisions as a function of both initial system size ( $N_{part}$ ) and the final size ( $N_{mult}$ ) at these collision energies.