

Title:

Higher-order diagonal cumulants of net- $\Lambda$  multiplicity distributions and off-diagonal cumulants between net-proton and net-kaon multiplicity distributions in Au+Au collisions at  $\sqrt{s_{\text{NN}}} = 27$  GeV at STAR

Changfeng Li (for the STAR Collaboration)  
Shandong University, Qingdao, China

Susceptibilities of conserved quantities, such as net-charge, net-baryon, and net-strangeness are sensitive to the quantum chromodynamics (QCD) phase transition, and also the QCD critical point. The prime aim of the RHIC beam-energy scan program is to explore the QCD phase diagram and search for the location of QCD critical point using higher order cumulants of net-proton ( $\Delta p$ ), net-charge ( $\Delta Q$ ), and net-kaon ( $\Delta k$ ) multiplicity distributions. Additionally, the cumulants of net-Lambda ( $\Delta\Lambda$ ) multiplicity distributions could provide an access to explore flavor-dependent chemical freeze-out parameters in the QCD phase diagram. In the year 2018, the STAR experiment has collected high statistics minimum bias data in Au+Au collisions at  $\sqrt{s_{\text{NN}}} = 27$  GeV. We present the higher-order diagonal cumulants (1st to 4th order) and their ratios of  $\Delta\Lambda$  multiplicity distributions. A comparison between higher order cumulants of  $\Delta\Lambda$  and  $\Delta k$  multiplicity distributions are discussed. Furthermore, the off-diagonal cumulants between  $\Delta p$ - $\Delta k$  at this collision energy along with other published BES results will be discussed.