Higher-order Cumulants of Proton Multiplicity Distributions in Au+Au Collisions at $\sqrt{s_{NN}} = 3$ GeV from STAR

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Experimental evidences at RHIC and the LHC have demonstrated the formation of Quark-Gluon Plasma (QGP) in ultra-relativistic heavy-ion collisions at small baryon chemical potential ($\mu_B \approx 0$ MeV) where the phase transition from the hadronic matter to QGP is suggested to be a crossover from state-of-the-art Lattice QCD calculations. It has been conjectured that there is a first-order phase transition and a critical point at finite μ_B region in the QCD phase diagram. In search of the possible QCD critical point, higher-order cumulants of conserved quantities (B, Q, S) are sensitive observables to locate its position.

In this talk, we will report analysis status of higher-order cumulants of proton multiplicity distributions in Au+Au collisions at $\sqrt{s_{NN}}$= 3 GeV collected by STAR at RHIC from the year 2018. Corresponding analysis techniques, like efficiency correction, pileup correction, and volume fluctuation correction will be discussed.