

# Higher-order Cumulants of Net-Proton, Net-Charge and Net-Kaon Multiplicity Distributions in Au+Au Collisions at $\sqrt{s_{NN}}=27$ GeV from STAR Run18

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Higher-order cumulants of conserved quantities (B, Q, S) as sensitive observables to study the QCD phase structures. However, they could be affected by various background contributions, such as volume fluctuations. An Event Plane Detector (EPD) was installed at forward rapidity ( $2.1 < |\eta| < 5.1$ ) in the STAR experiment and recorded data for Au+Au collisions at  $\sqrt{s_{NN}}=27$  GeV in 2018. The EPD will provide collision centrality estimates with high resolution and hence allows one to study those background effects in the fluctuation measurements at midrapidity.

In this poster, we will present higher-order cumulants (up to the 4th order) of net-proton, net-charge and net-kaon multiplicity distributions in Au+Au collisions at  $\sqrt{s_{NN}}=27$  GeV with centrality determined using EPD. Comparison with measurements made from the STAR Beam Energy Scan phase I data with centrality determined from particles at midrapidity will be given. The physics implications of the results and a detailed discussion of the background contributions will be also presented.