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## Exploring the QCD phase diagram with conserved charge fluctuations

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Higher order cumulants of fluctuations of conserved charges are an important diagnostic tool for the thermodynamic properties of strong interacting matter close to freeze out at LHC energies as well as in the entire energy range covered with the beam energy scan (BES) at RHIC.

We present recent progress on the calculation of conserved charge fluctuations with highly improved staggered quarks (HISQ action).

In particular we will focus on higher order cumulants up to the 6th order of net baryon number, net electric charge and net strangeness fluctuations. We will discuss how these quantities approach the hadron resonance gas at low temperatures and to what extent they show sensitivity to universal scaling behavior. Based on this analysis we discuss possible consequences for the QCD phase diagram and the

radius of convergence of the Taylor expansion of the QCD partition function. The latter can be used to locate the QCD critical point.

Furthermore, we specify a procedure to extract freeze-out conditions from various ratios of conserved charge fluctuations measured in the BES at RHIC.

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