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Susceptibilities from a black hole engineered EoS with a critical point

Currently at the Beam Energy Scan at RHIC experimental efforts are being made to find the QCD critical point. On the theoretical side, the behavior of higher-order susceptibilities of the net-baryon charge from Lattice QCD may allows us to estimate its position via Taylor expansion of the density of states at $\mu_B = 0$. However, even if the series expansion continues to higher-orders, there is always the possibility to miss the critical point behavior due to truncation errors.

An alternative approach to exploring the QCD critical point is using black hole engineering. This method allow us to obtain susceptibilities fitting the lattice data at $\mu_B = 0$ but also can be expanded out to extremely large baryonic chemical potentials as well. Additionally, in the black hold engineered EoS there is a clear critical point at $\mu_B = 725$ MeV and $T = 80$ MeV. In this talk, we obtain the freeze-out line and compare it with the hadron resonance gas model, lattice calculations, and experimental data. We also explore fluctuations at the lowest energies at the beam energy scan to see if there are signatures of the critical point.

Preferred Track

Correlations and Fluctuations

Collaboration

Not applicable

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