Contribution ID: **14** Type: **not specified**

Holographic QCD Equation of State Modeling in the Bayesian Era

Thursday, 1 December 2022 17:50 (20 minutes)

Predictions for the QCD equation of state across the phase diagram are made using Bayesian inference techniques within the holographic gauge/gravity correspondence. For that, we employ a Einstein-Maxwell-Dilaton (EMD) model capable of reproducing the latest lattice QCD results at zero and finite baryon density, known to predict a high-density critical endpoint. For the first time, we numerically find the posterior probability distribution for holographic model parameters from the lattice data at zero chemical potential, and extract their most likely values. This is possible thanks to new numerical developments which, by boosting the performance of our calculations, allow us to sample a large number of fits to the data via Monte Carlo methods. Thus, we find the maximum a posteriori estimate for the location of the critical point, as well as estimates for the corresponding statistical error bands. We determine the linear combination of model parameters which is the most relevant for these uncertainties and investigate its role for the equation of state at lower densities. Finally, we compare competing parametrizations of the EMD model and discuss systematic uncertainties.

Primary authors: HIPPERT TEIXEIRA, Mauricio (University of Illinois at Urbana-Champaign); GREFA, Joaquin; Prof. NORONHA, Jorge (University of Illinois at Urbana-Champaign); Prof. NORONHA-HOSTLER, Jacquelyn (University of Illinois Urbana Champaign); PORTILLO, Israel (University of Houston); RATTI, Claudia; ROUGEMONT, Romulo

Presenter: HIPPERT TEIXEIRA, Mauricio (University of Illinois at Urbana-Champaign)

Session Classification: Neutron Stars and very high mu_B - 1