Abstract Submitted
for the TSF21 Meeting of
The American Physical Society

Constraining attractive and repulsive interactions in the excluded volume HRG model JAMIE KARTHEIN, University of Houston, VOLKER KOCH, Lawrence Berkeley National Laboratory , CLAUDIA RATTI, University of Houston, VOLODYMYR VOVCHENKO, Lawrence Berkeley National Laboratory — We investigate extensions of the Hadron Resonance Gas (HRG) Model beyond the ideal case by including attractive and repulsive interactions to the model [1]. When considering additional states exceeding those measured with high confidence by the Particle Data Group, additive corrections to the overall pressure in the HRG model are imposed. We also study the effect of including excluded-volume (EV) corrections. In the version of the EV-HRG model that we utilize, we ensure that no two baryons occupy the same space by turning on repulsive (anti)baryon-(anti)baryon interactions. Furthermore, we see that these two extensions are complementary and focus on the agreement of our EV-HRG model results with first-principles lattice QCD calculations on fluctuations of conserved charges. We note that these results are interesting for studies of the chemical freeze-out stage in heavy-ion collisions at both the LHC and RHIC. We find interesting ratios of susceptibilities that are sensitive to one correction and not the other. This allows us to constrain the excluded volume and particle spectrum effects separately. We see intriguing indications that a smaller excluded volume is preferred for hyperons as compared to non-strange baryons. 1. J. M. Karthein, *et al*, arXiv: 2107.00588

Jamie Karthein
University of Houston

Date submitted: 08 Sep 2021 Electronic form version 1.4