

Abstract Submitted
for the TSF21 Meeting of
The American Physical Society

Strangeness-neutral equation of state for QCD with a critical point.¹ DAMIEN PRICE, JAMIE KARTHEIN, ANGEL NAVA ACUNA, CLAUDIA RATTI, University of Houston, DEBORAH MROCZEK, JACQUELYN NORONHA-HOSTLER, University of Illinois at Urbana-Champaign, PAOLO PAROTTO, University of Wuppertal — We construct a family of equations of state for QCD in the temperature range $30 \leq T \leq 800$ MeV and in the chemical potential range $0 \leq \mu_B \leq 450$ MeV [1]. These equations of state match available lattice QCD results up to $O(\mu_B^4)$ and in each of them we place a critical point in the 3D Ising model universality class. Our results for the pressure, entropy density, baryon density, energy density and speed of sound can be used as inputs in the hydrodynamical simulations of the fireball created in heavy ion collisions. We follow the approach presented in Ref. [2], but we extend it to a more realistic scenario, which reflects the net-strangeness and net-electric charge content of the colliding nuclei in heavy-ion collisions. [1] J. M. Karthein, D. Mroczek, A. R. Nava Acuna, J. Noronha-Hostler, P. Parotto, D. Price, C. Ratti, *Eur.Phys.J.Plus* 136 (2021) 6, 621. [2] P. Parotto, M. Bluhm, D. Mroczek, M. Nahrgang, J. Noronha-Hostler, K. Rajagopal, C. Ratti, T. Schaefer, M. Stephanov, *Phys. Rev. C* 101 (2020) 034901.

¹This research is supported in part by the National Science Foundation Limit (Grant n. PHY-1654219) and in part by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, within the framework of the Beam Energy Scan Theory (BEST) Topical Collaboration.

Damien Price
University of Houston

Date submitted: 09 Sep 2021

Electronic form version 1.4