Coupling the Lattice QCD Equation of State to the Liquid-Gas Phase Transition BORE GAO, DBORA MROCZEK, JACQUELYN NORONHA-HOSTLER, University of Illinois at Urbana-Champaign — Here we use a van der Waals equation of state to simulate the liquid-gas phase transition in order to map it into the high-temperature equation of state reconstructed from Lattice Quantum Chromodynamic (QCD) that also has a high-temperature critical point from a parameterized 3D Ising model. Previously, only an ideal hadron resonance gas was used for this equation of state. Instead, we use the van der Waals equation of state with the grand canonical ensemble (GCE) formulation with quantum statistics, which incorporates constants that represent attractive and repulsive interactions. We used the comprehensive list of particles (the PDG16+) and adjusted the interaction terms in order to reproduce the location of the liquid-gas phase transition.

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