High Energy Physics Seminar

Department of Physics

Tuesday, February 11, 2020

"Viscous Hydrodynamics at the Beam Energy Scan"

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Currently the RHIC Beam Energy Scan is exploring a new region of the Quantum Chromodynamic phase diagram at large baryon densities that approaches nuclear astrophysics regimes. This provides an opportunity to study relativistic hydrodynamics in a regime where the net conserved charges of baryon number, strangeness, and electric charge play a role, which will significantly change the theoretical approach to simulating the baryon-dense Quark-Gluon Plasma. Here I detail many of the important changes needed to adapt both initial conditions and the medium to baryon-rich matter. The creation of a new initial conditions ICCING that initializes conserved charges is introduced. Challenges within relativistic hydrodynamics with viscosity and 1+ conserved charges are discussed. Then, I make baseline predictions for the elliptical flow and fluctuations based on extrapolating the physics at LHC and top RHIC energies to support future analyses of where and how the new baryon-dense physics causes these extrapolations to break down.

The seminar will be held at 3pm in 2214 SES.