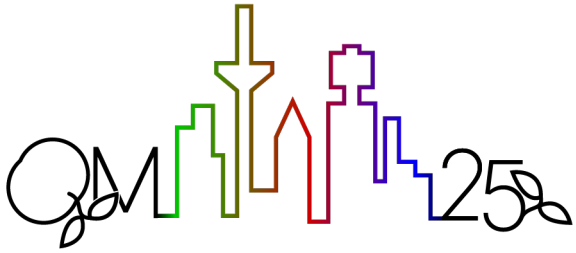

Contribution ID: **115** Type: **Oral**

BHAC-QGP: three-dimensional MHD simulations of relativistic heavy-ion collisions

Tuesday 8 April 2025 12:10 (20 minutes)

We present BHAC-QGP, an advanced numerical code designed to simulate the evolution of quark-gluon plasma (QGP) in heavy-ion collisions with enhanced accuracy in the presence of magnetic field. Building on the foundation of the Black Hole Accretion Code (BHAC), which solves general-relativistic magnetohydrodynamic (GRMHD) equations for astrophysical phenomena, BHAC-QGP adapts these capabilities to the unique challenges of high-energy nuclear collisions. BHAC-QGP leverages Adaptive Mesh Refinement (AMR) to dynamically enhance resolution in regions requiring high precision, enabling detailed tracking of QGP properties over a wide range of length scales. We present applications of BHAC-QGP to gold-gold (Au-Au) collisions at RHIC energies, demonstrating its superior accuracy over existing models and confirming its consistency with established results. These advancements underscore BHAC-QGP's potential as a robust tool for precision studies in relativistic heavy-ion physics.

Category

Theory

Collaboration (if applicable)

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