Contribution ID: **223** Type: **Poster**

Charge-dependent anisotropic flow in relativistic resistive magneto-hydrodynamic expansion

Tuesday 25 April 2023 17:40 (20 minutes)

We have investigated the charge-dependent anisotropic flow in high-energy heavy-ion collisions, using relativistic resistive magneto-hydrodynamics (RRMHD).
First, we construct a relativistic resistive magneto-hydrodynamic (RRMHD) numerical simulation code for high-energy heavy-ion collisions. We confirm that our code reproduces well the results of standard RRMHD tests in the Cartesian coordinates and in the Milne coordinates.
Next, we apply our RRMHD code to analysis of the charge-dependent anisotropic flow in high-energy heavy-ion collisions. We consider the optical Glauber model as an initial model of the quark-gluon plasma (QGP) and the solution of the Maxwell equations with source term of the charged particles in two colliding nuclei as initial electromagnetic fields. The RRMHD simulation is performed with these initial conditions in Au-Au and Cu-Au collisions at $\sqrt{s_{NN}}$ = 200 GeV. We have calculated the charge-odd contribution to the directed flow Δv_1 and elliptic flow Δv_2 in both collisions based on electric charge distributions as a consequence of RRMHD. We conclude that the charge-dependent anisotropic flow is a good probe to extract the electrical conductivity of the QGP medium in high-energy heavy-ion experiments.

Nakamura, Miyoshi, Nonaka and Takahashi, Phys.Rev.C 107 (2023) 1, 014901.
Nakamura, Miyoshi, Nonaka and Takahashi, 2211.02310 [nucl-th].
Nakamura, Miyoshi, Nonaka and Takahashi, 2212.02124 [nucl-th].

Theory / experiment

Theory

Group or collaboration name

Primary authors: NONAKA, Chiho; TAKAHASHI, Hiroyuki; NAKAMURA, Kouki; MIYOSHI, Takahiro (Hiroshima University (JP))

Presenter: NONAKA, Chiho

Session Classification: Poster Session

Track Classification: New theoretical developments