

Dynamics of the conserved net-baryon density near QCD critical point within QGP profile

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Searching the QCD critical point is one of the most important goals of the relativistic heavy-ion collisions. It is essential to build a realistic dynamical model near the QCD critical point and predict the characteristic signature induced by critical fluctuations in experimental measurements. By studying the dynamics of the conserved net-baryon density near critical point, it was found that both second- and fourth-order multiplicity fluctuations behave non-monotonically with respect to the increasing rapidity acceptance [1,2]. However, these works base on the assumption that the QGP fireball is homogenous with constant temperature and chemical potential in the coordinate space, which is not the case in realistic contexts. In this talk, we will present the dynamics of conserved net-baryon density near the critical point within the inhomogeneous temperature and chemical potential background, borrowing from hydrodynamic simulations [3]. We found that a pronounced enhancement of various orders of multiplicity fluctuations at large rapidity due to the inhomogeneous hydro background. We will also present the non-trivial behavior of multiplicity fluctuations across the freeze-out hyper surface implemented by the hydro background.

[1] Miki Sakaida, Masayuki Asakawa, Hirotugu Fujii, Masakiyo Kitazawa. *Phys.Rev.C* 95 (2017) 6, 064905

[2] Grégoire Pihan, Marcus Bluhm, Masakiyo Kitazawa, Taklit Sami, Marlene Nahrgang. *Phys.Rev.C* 107 (2023) 1, 014908

[3] Shanjin Wu and Huichao Song. In preparation.

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