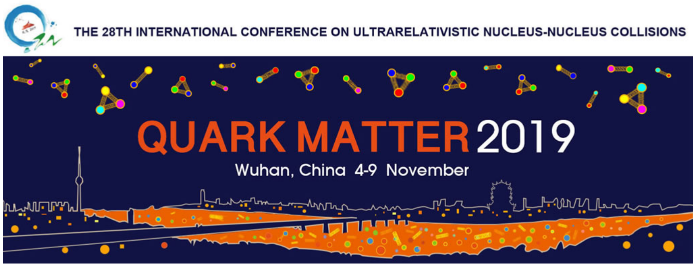

Contribution ID: **219**   Type: **Poster Presentation**

Factorization breaking in transverse momentum from hydrodynamic fluctuations

Monday 4 November 2019 17:40 (20 minutes)

In recent years, factorization breaking of flow coefficients in transverse momentum has been measured by CMS Collaboration [1] to understand the transport properties of QGP. The factorization ratio r_n measured in Pb + Pb collisions at LHC represents the decorrelation of the event plane angle in different transverse momentum regions. When $r_n = 1$, which implies the coincidence of the event-plane angles along transverse momentum direction, r_n can be factorized into the anisotropic flow coefficients v_n in the individual transverse momentum regions. However, $r_n < 1$ means the event-plane angles differ from each other and consequently this factorization is broken. Hydrodynamic fluctuations are expected to break the factorization because they disturb the event plane.

In this study, we analyze the factorization ratio r_n in the direction of transverse momentum by using an integrated dynamical model [2] that incorporates thermal fluctuations into the relativistic hydrodynamic model. The QGP produced in high-energy heavy-ion collisions expands rapidly, cools down and becomes a hadron gas in a short time period. Thus, the QGP cannot be measured directly. Therefore, the transport properties of QGP are explored through analysis of the hadron momentum distribution measured by the detector. Since the final state hadron observables carry the information on the whole history of the space-time evolution of the system, it is important to construct an integrated dynamical model that describes the whole reaction. Using this integrated dynamic model incorporating hydrodynamic fluctuations, we compare the analysis results of the factorization ratio in the transverse momentum direction with the experimental results and discuss the influence of the hydrodynamic fluctuations on the factorization ratio in the transverse momentum direction.

[1] CMS Collaboration, Phys. Rev. C 92, 034911 (2015)
[2] K. Murase, Ph. D thesis, The University of Tokyo (2015)

Author: GOGUN, Yuki (Sophia University)

Co-authors: SAKAI, Azumi; MURASE, Koichi (Sophia University); HIRANO, Tetsufumi (Sophia Univ)

Presenter: GOGUN, Yuki (Sophia University)

Session Classification: Poster Session

Track Classification: Collective dynamics and final state interaction