Contribution ID: **9** Type: **Talk**

Probing the longitudinal matter distribution in heavy ion collisions with heavy flavor

Tuesday, 22 May 2018 11:00 (30 minutes)

Non-central relativistic heavy ion collisions break longitudinal boost invariance due to forward-backward asymmetry in local participant densities. This gives rise to the observed rapidity-odd directed flow of charged particles. We demonstrate that the heavy flavor
v_1 due to the forward-backward asymmetric drag of the bulk is several times larger than that of the bulk v_1[1]. This makes the heavy flavor v_1 slope at mid-rapidity, a sensitive probe of the initial longitudinal distribution of the thermalized medium. Further, the electromagnetic fields of the initial stage can also give rise to rapidity-odd v_1 but of opposite signs for D and $\bar{D}$ mesons, unlike the tilt mechanism which provides same sign v_1 to both D and $\bar{D}$. We show that the measurement of the v_1 sum as well as difference of D and $\bar{D}$ can provide simultaneous constraint on the initial longitudinal asymmetry in matter distribution as well as the electromagnetic field
produced by the passage of the heavy nuclei.

[1]. S. Chatterjee and P. Bożek (2017), arXiv:1712.01189 [nucl-th]

Primary authors: BOZEK, Piotr (AGH-UST); CHATTERJEE, sandeep (AGH-UST)

Presenter: CHATTERJEE, sandeep (AGH-UST)

Session Classification: Contributed Talks