

QPT 2021

Guiyang, China

Contribution ID: 84

Type: not specified

Studying the initial geometry and the QGP properties by directed flow of inclusive jets in heavy-ion collisions

The main goal in heavy-ion collisions is to study the properties of hot-dense QCD medium, known as Quark-Gluon Plasma (QGP). Jets and collective phenomena have led to further understanding of the properties of QGP. Due to the interplay of rapidity symmetric binary collision profile, initially tilted bulk geometry and energy loss mechanism inside the QGP, jets may experience a non-zero directed flow in non-central collisions. The comparison of inclusive jet and $D^0 v_1$ may shed light on the bulk medium properties and initial tilted geometry.

We demonstrate the methodology to perform inclusive jet v_1 measurement in heavy-ion collisions using AMPT model. To understand the p+p baseline, the PYTHIA event generator is used. In this talk, we will discuss the techniques and results using the aforementioned event-generators in Au+Au and p+p collisions at $\sqrt{s_{NN}} = 200$ GeV. This study will help us to utilize inclusive jet v_1 as a direct 3D probe of initial matter in heavy-ion collisions at RHIC and the LHC.

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