



Contribution ID: 80

Type: Talk

Overview of collective dynamics with STAR at RHIC

Monday 21 July 2025 17:50 (25 minutes)

High-energy heavy-ion collisions offer a unique opportunity to study the dynamics of nuclear matter. Analyzing flow harmonics such as directed, elliptic, and higher order flow harmonics (v_1 , v_2 , and v_n , $n > 2$) provides insights into the dynamics and properties of the Quark-Gluon Plasma (QGP). The v_1 slope (dv_1/dy) at mid-rapidity of net-baryons is expected to be sensitive to the first-order phase transition. The number of constituent quark (NCQ) scaling of v_2 is considered a signal of the formation of QGP. Triangular flow (v_3), typically arising from initial state fluctuations, is expected to provide constraints on the initial state geometry and fluctuations.

In this talk, we will discuss measurements based on various data sets collected by the STAR experiment at RHIC, focusing on collective flow at top RHIC energy ($\sqrt{s_{NN}} = 200$ GeV), the Beam Energy Scan (BES) program ($\sqrt{s_{NN}} = 3.0$ to 62.4 GeV), including the Fixed Target (FXT) program ($\sqrt{s_{NN}} < 4.5$ GeV). This includes results from the data collected with Au+Au collisions, smaller systems such as O+O and Cu+Cu, as well as deformed nuclei such as Isobars (Ru+Ru and Zr+Zr) and U+U collisions. We will discuss transverse momentum (p_T), rapidity (y), and centrality dependence, as well as beam energy dependence of flow harmonics. The experimental results will be compared with model calculations to improve our understanding of the underlying physics mechanisms in heavy-ion collisions.

Internet talk

Yes

Is this an abstract from experimental collaboration?

Yes

Name of experiment and experimental site

STAR Collaboration

Is the speaker for that presentation defined?

Yes

Details

Dr. Vipul Bairathi, Instituto de Alta Investigación, Universidad de Tarapacá, Chile
<https://www.uta.cl/>

Author: Dr BAIRATHI, Vipul (Instituto de Alta Investigación, Universidad de Tarapacá)

Presenter: Dr BAIRATHI, Vipul (Instituto de Alta Investigación, Universidad de Tarapacá)

Session Classification: Heavy Ion Collisions and Critical Phenomena

Track Classification: Main topics: Heavy Ion Collisions and Critical Phenomena