QUARK MATTER 2015
Sep. 27 – Oct. 3, 2015 Kobe, Japan

Contribution ID: **236** Type: **Poster**

Investigation of collective behaviors in pp and p+Pb collisions at the LHC energies

Tuesday, 29 September 2015 16:30 (2 hours)

Flow measurements in p+Pb collisions at $\sqrt{s_{NN}}$=5.02 TeV have indicated the development of collective flow in the small systems
created at the LHC. Using the ultrarelativistic quantum molecular dynamics (UrQMD) model, we investigate the azimuthal
correlations in p+Pb collisions at $\sqrt{s_{NN}}$=5.02 TeV with two- and four-particle cumulants. Our calculations indicate that pure hadronic
interactions can not generate the collective flow as measured in experiments, additional effects from initial state and/or
from the QGP are needed to reproduce the flow data[1].
Using the same flow analysis method, we predict the collective flow in pp collisions at $\sqrt{s}$ = 13 TeV with three different
baseline calculations, including: 1. UrQMD hadronic cascade simulations with the assumption that high energy pp collisions
only create pure hadronic systems, 2. VISHNU hybrid model simulations that connect viscous hydrodynamics for the QGP expansion
and UrQMD for the hadron resonance gas evolution, using smooth initial conditions,
3. VISHNU simulations with fluctuating initial conditions. We find that triangular flow (if observed) is one of the
unique observable directly associated with the domain structures in the created small pp systems.

References:
1. Y. Zhou, X. Zhu, P. Li and H. Song,
"Investigation of possible hadronic flow in $\sqrt{s_{NN}}$=5.02TeV p+Pb collisions," Phys.Rev. C 91, no. 6, 064908 (2015).

On behalf of collaboration:

NONE

Primary author: Dr ZHU, Xiangrong (Peking University)

Co-authors: SONG, Huichao; ZHOU, You (Niels Bohr Institute (DK))

Presenter: Dr ZHU, Xiangrong (Peking University)

Session Classification: Poster Session

Track Classification: QGP in Small Systems