The 22nd International Conference on
Strangeness in Quark Matter
22-27 March, 2026, Los Angeles, CA

Contribution ID: **157**

Type: **Poster Presentation**

π/K/p/φ flow in O+O and d+Au collisions

Tuesday, 24 March 2026 18:58 (1 minute)

The collective expansion of Quark-Gluon Plasma (QGP) is characterized by distinct experimental signatures, such as mass ordering[1] of hadron anisotropic flow coefficients (v_n) and the Number of Constituent Quarks (NCQ) scaling[2]. This poster aims to investigate these key signatures in small collision systems by measuring the anisotropic flow (v_n) for identified particles (pions, kaons, protons, and ϕ-mesons) in O+O and d+Au collisions at $\sqrt{s_{NN}}$ =200 GeV, using data from the STAR experiment's 2021 run. By investigating mass ordering in flow coefficients at low p_T, we will be able to probe the potential development of radial flow, as expected from hydrodynamic expansion. At intermediate p_T, the v_n values of different hadron species will be tested for NCQ scaling, a signature that would indicate hadronization via the coalescence of constituent quarks from a collectively flowing partonic medium. The ϕ-meson, being largely insensitive to hadronic rescattering, would serve as a clean probe of the early partonic stage and behavior consistent with a common partonic flow. Furthermore, a comparison between d+Au and O+O collisions at similar multiplicities but different initial-state geometries, will be performed. This comparison will be essential in demonstrating if the magnitude of flow and the degree of scaling depend on system size and initial pressure gradients, hence providing crucial insights into the properties of the QGP created in small-system collisions.

References:

[1] C. Adler et al. Identified particle elliptic flow in au + au collisions at √sNN = 130GeV.Phys. Rev. Lett., 87:182301, Oct 2001.
[2] J. Adams et al. Azimuthal anisotropy in au+au collisions at √sNN = 200 GeV. Phys. Rev. C, 72:014904, Jul 2005.

Author: PAUL, Souvik (Stony Brook University)

Presenter: PAUL, Souvik (Stony Brook University)

Session Classification: Poster Session