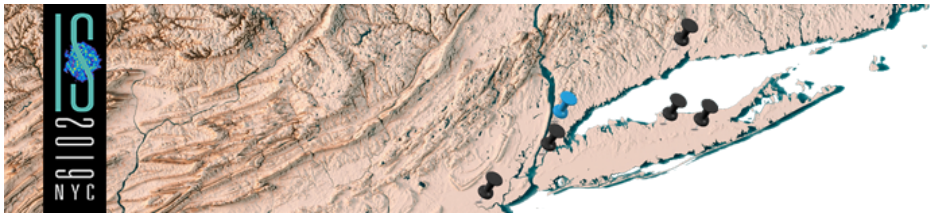

Contribution ID: **15** Type: **Poster**

v_n–p_{T} correlations in 5.02 TeV Pb+Pb and p+Pb collisions with the ATLAS detector

Tuesday, June 25, 2019 4:16 PM (1 minute)

Recently collected data by the ATLAS experiment at the LHC offer opportunities to explore dynamic properties of quark-gluon plasma. A new tool to study these properties is the modified Pearson's correlation coefficient, ρ, that quantifies the correlation between the mean transverse momentum in an event,$[p_{\mathrm{T}}]$, and the square of the flow harmonic magnitude, v_n^2. To suppress non-flow effects, v_n^2 is calculated by correlating charged particles from two sub-events covering opposite pseudorapidity ranges of $0.75 < |\eta| < 2.5$ while $[p_{\mathrm{T}}]$ is evaluated for particles with $|\eta| < 0.5$. The measurement of ρ is performed using minimum-bias p+Pb and Pb+Pb collisions at the same energy $\sqrt{s_{\mathrm{NN}}} = 5.02$~TeV allowing for a comparison of the medium dynamics in small and large systems. In Pb+Pb collisions, values of ρ coefficients are found to significantly deviate from zero for studied harmonics (v_2, v_3, and v_4). The coefficients as a function of centrality are observed to be weakly dependent on the transverse momentum range of the selected particles, despite large differences in the mean transverse momentum in an event and the magnitude of fluctuations of flow harmonics. The ρ coefficient in Pb+Pb collisions for the second order harmonics has a positive value for mid-central collisions and decreases in the most central events. In p+Pb collisions the ρ coefficient is measured only for the second order flow harmonics. In both p+Pb and peripheral Pb+Pb collisions, it is found to be negative. All measured coefficients are compared to theoretical models.

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Session Classification: Posters

Track Classification: Collectivity in small systems