Measurement of $K^*(892)$ and $\phi(1020)$ production in p-Pb collisions at $\sqrt{s_{NN}} = 8.16$ TeV with ALICE at the LHC

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1. Motivation

- Recent measurements of highest multiplicity pp and p-Pb collisions exhibit behaviour similar to peripheral Pb-Pb collisions [1].
- Do p-Pb collisions exhibit collective behaviour as seen in A-A collisions?

2. Experiment and analysis details

Data: p-Pb sample at $\sqrt{s_{NN}} = 8.16$ TeV collected in 2016
MC: Dmpjett
Multiplicity estimator: Using VOA multiplicity classes (2.8 < $η_{c}< 5.1$)
PID: TPC + TOF

K* and $\phi$ are reconstructed via their hadronic decay channels by Invariant mass method.

3. $p_T$ spectra

- $p_T$ spectra are measured in various multiplicity classes using VOA multiplicity estimator.
- Lower panels show ratio of spectra in a given multiplicity class to NSD(0-100%).
- Inverse slope of $p_T$ spectra increases with increasing multiplicity for low $p_T$.

4. $dN/dy$ and $<p_T>$

- $dN/dy$ (Integrated yield) is obtained in various multiplicity classes.
- It increases approximately linear with average charged particle multiplicity.
- The $dN/dy$ values of K* and $\phi$ are consistent with the measurements from other energies and systems for a given $dN/dy$.

5. $dN/dy/dN_{ch}$

- To test how the $dN/dy$ scales with multiplicity, the results have been normalized to the charged particle multiplicity in a given multiplicity class for the various energies and systems.
- Results for various energies and systems show multiplicity independent trend as a function of average charged particle multiplicity.

6. Summary

- $K^*$ and $\phi$ mesons have been measured in p-Pb collisions at 8.16 TeV with ALICE detector at the LHC.
- $p_T$ spectra for high multiplicity events are observed to be harder.
- $dN/dy$ of K* and $\phi$ is observed to rise approximately linear with charged particle multiplicity.
- $<p_T>$ of K* and $\phi$ in low multiplicity change rapidly whereas high multiplicity, no significant increase with charged particle multiplicity.
- Ratio $dN/dy/dN_{ch}$ are seen to be multiplicity independent and show a good agreement with results for pp and Pb-Pb collisions.

References