Investigating strangeness enhancement in jets and medium in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV with ALICE

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Motivation: Strangeness enhancement

• We see an increase in s-quark production as function of particle multiplicity across all collision systems

• Measuring this enhancement in/out of jets can help determine its origins (thermal production in QGP medium/something else?)

• Λ and φ(1020) are excellent candidates to probe this enhancement:

Λ^0 :  u  d  s

φ(1020) :  s  s
Motivation: *Baryon over meson ratio*

- We see an increase in the ratio of baryons over mesons as a function of multiplicity across all collision systems.
- The baryon over meson ratio is used to study fragmentation, recombination.
- We can investigate the \( \Lambda \) over \( \phi(1020) \) ratio in different kinematic regions with respect to multiplicity to gain insight into the origins of this enhancement.
Analysis: Two-particle correlations

- Used to separate events into 3 kinematic regions:
  - near side
  - away side
  - underlying event

- Can investigate $h-\Lambda/h-h$ and $h-\phi(1020)/h-h$ with respect to multiplicity in each kinematic region
Results: $h-$φ(1020)/$h-h$ ratio

- The inclusive ratio lines up with previously published φ(1020)/π ratios
- The near-side ratio appears much flatter than the away-side ratio with respect to multiplicity
- Strangeness production appears to be modified by medium interaction (away-side)

[Graph showing results with labels and data points]
Next steps: $\Lambda$ reconstruction

Two techniques for reconstructing lambdas:

**Resonance technique**
- Combine all $p$-$\pi$ pairs in the event
- Large combinatorial background
- Maximal statistics
- Invariant mass schematic shown to right

**V0 technique**
- Use V0 finder: unlike sign $p$-$\pi$ tracks that have small DCA
- Very small background
- ~40% less statistics when compared with resonance technique
- Invariant mass schematic shown to right

In this analysis we will be using both techniques in parallel (to be used for comparison)
- Once we have the final h-$\Lambda$/$h$-$h$ ratio results, we can combine these results with the $\phi$ to extract the $\Lambda$/$\phi$ ratio with respect to multiplicity!