Long-range two-particle correlations with $K^0_S$ and $\Lambda$ in pPb and PbPb collisions

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Motivation
- Observation of a significant long-range near-side two-particle correlation in pPb collisions opened a new avenue of studying novel QCD phenomena in small systems.
- In the context of hydrodynamic models, anisotropic flow ($v_n$) for unidentified charged particles in pPb collisions have been extensively studied by the CMS collaboration.

Identified particle $v_2$ in AA at RHIC

Elliptic flow ($v_2$) of identified particles in AA collisions at RHIC:
- Mass ordering of $v_2$ at $p_T$ below 2 GeV, consistent with hydrodynamic models.
- Number of constituent quark scaling phenomena - Recombination.

V$^0$ ($K^0_S$, $\Lambda$) Reconstruction and High Multiplicity Triggers
- $V^0$ reconstruction via topological decays in CMS silicon tracker
- Unique high-level triggers enable precise studies of PID $v_n$ in very high multiplicity pPb events

Results
- Low multiplicity from MinBias trigger
  - No near-side ridge observed
  - Dominated by jet correlations with little species dependence
  - Mass ordering of $v_2$ emerges at $N\geq60$ in pPb and PbPb

High precision PID $v_n$ data in pPb and PbPb over a broad multiplicity range

Comparison to PbPb at comparable multiplicities
- Evident mass ordering of $v_2$ between $K^0_S$ and $\Lambda$ with larger splitting in pPb than PbPb
- Number of constituent quark scaling for $v_n$ holds within 10-15% in pPb at high multiplicity, which holds less well in peripheral PbPb.