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Strange Hadrons at Intermediate p_T: Probing Collectivity and Hadronization in OO and NeNe Collisions at the LHC

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Collective phenomena and the baryon-to-meson ratio in high-energy nuclear collisions provide unique insights into the formation and evolution of the quark–gluon plasma (QGP). For the first time, elliptic (v_2) and triangular (v_3) flow coefficients of strange hadrons (Λ and K^0_S), together with Λ/K^0_S ratios, are measured in light-ion (OO and NeNe) collisions at $\sqrt{s_{NN}}$=5.36 TeV with the CMS detector at the LHC. The measurements investigate the particle-species and transverse momentum (p_T) dependence of collective behavior and the potential scaling with the number of constituent quarks (n_q), highlighting the interplay of hydrodynamic expansion, partonic collectivity, and hadronization via quark coalescence. The centrality and p_T dependence of the Λ/K^0_S ratio underscores the role of radial flow and quark coalescence in particle production. Comparisons with pp, pPb, and PbPb collisions provide fresh insights into collective expansion and the evolution of the QGP from small to large collision systems. In addition, the centrality dependence of v_2 and v_3 of charged hadrons in OO and NeNe collisions is presented to characterize the hydrodynamic response to the initial geometry.

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