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Exploring QGP Signatures in Small System: Insights from ALICE in Pb-Pb and pp Collisions

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At LHC energies, signatures typically attributed to quark-gluon plasma (QGP) formation have been observed in small collision systems such as pp and p-Pb. In particular, observables such as transverse-momentum spectra, azimuthal anisotropy in particle production, strangeness enhancement and baryon-over-meson ratios, exhibit behaviors resembling heavy-ion collisions. These observables depend strongly on the final-state charged-particle multiplicity. The high-multiplicity triggered data from pp collisions in Run 2, and the new data collected with the upgraded ALICE detector in Run 3 enabled precise measurements in this context. This contribution will present recent results based on pp collisions, including particle production, differential studies of strangeness, baryon-to-meson ratios, and anisotropic flow. Furthermore, comparisons with results in Pb-Pb collisions will be conducted to outline the limits of QGP formation.

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