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Unraveling the origin of collectivity in high and low multiplicity pp and p–Pb collisions in ALICE at the LHC

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We investigate the possibility of a partonic phase in small systems by measuring the elliptic flow of mesons (π^{+-}, K^{+-}, K^0) and baryons (p+$\bar{p}$, Λ+$\bar{\Lambda}$) in high-multiplicity p–Pb collisions at $\sqrt{s_{NN}}$ = 5.02 TeV and pp collisions at $\sqrt{s}$ = 13 TeV measured by ALICE. The results show a grouping (with 1σ significance) and splitting (with 5σ confidence) behavior of v_2 at intermediate pt. This phenomenon, reminiscent of partonic flow in heavy-ion collisions, has been observed with such high precision for the first time in small collision systems. Comparison with the hydrodynamic model with hadronization via quark coalescence indicates the formation of a deconfined partonic medium in small systems at high multiplicity. We further extend these measurements down to the lowest possible multiplicity in pp collisions employing the largest pseudorapidity separation ($5.0 < |\Delta\eta| < 6.0$) to explore the limits to the formation of the collective medium and presence of partonic degrees of freedom in small systems.

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