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Exploring system-size dependence of jet production and internal jet properties in pp and p-Pb collisions with ALICE

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Internal properties of jets and their production in small collision systems (pp and p–Pb) are tightly connected to perturbative and non-perturbative aspects of quantum chromodynamics (QCD), such as cold nuclear matter effects. Recent studies of high-multiplicity final states of small collision systems also exhibit signatures of collective effects that are thought to be associated with hot and dense, color-deconfined QCD matter, which is known to be formed in collisions of heavier nuclei. The absence to date of jet quenching signals raises a question about the origin of the observed collectivity and calls for more accurate jet quenching measurements in small collision systems. ALICE is uniquely positioned to do precise charged-particle jet measurements due to its high efficiency in the reconstruction of charged particles.

In this contribution, we will report new results on charged-particle jet production in p-Pb and pp collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV measured by ALICE in LHC Run 2. The data extend the transverse momentum range and jet cone radius span of previous measurements of $p_{\rm T}$ differential cross section spectra and nuclear modification factor $R_{\rm pPb}$ published by ALICE. In addition, the multiplicity dependence of charged-particle jet properties (mean charged-constituent multiplicity, transverse momentum profile and fragmentation functions) in p-Pb and pp collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV and $\sqrt{s_{\rm NN}} = 13$ TeV respectively will also be presented and compared to predictions of theoretical models.

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