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Intriguing similarities of high- p_T particle production between pp and A-A collisions

We study the particle production at high transverse momentum ($p_T > 8 \text{ GeV}/c$) in pp and Pb-Pb collisions at LHC energies. The characterization of the spectra is done using a power-law function and the resulting power-law exponent (n) is studied as a function of x_T for minimum-bias pp collisions at different \sqrt{s} . The functional form of n as a function of x_T exhibits an approximate universal behavior. PYTHIA8.212 reproduces the scaling properties and therefore, it is used to study the multiplicity-dependent particle production. Going from low to high multiplicities, the power-law exponent decreases. A similar behavior is also observed in heavy-ion collisions when one studies the centrality-dependent particle production. The interpretation of heavy-ion results requires the quantification of the impact of this correlation (multiplicity and high p_T) on jet-quenching observables.

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