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Surprising similarities between the high transverse momentum spectra in pp and Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV

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We present the comparison of the transverse momentum (p_T) spectra for different centralities in Pb-Pb collisions with multiplicity dependent spectra in pp collisions and the apparent link among them.

The origin of the work lies in two observations concerning particle production at high p_T (> 8 GeV/c) in pp and Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV. On one hand, within uncertainties the RAA of light and heavy flavoured particles is essentially the same. On the other hand, the identity of the rise observed in the RAA with that observed in the ratios of the multiplicity dependent spectra, in pp collisions, divided by the same pp reference spectrum. We have made a systematic study of available data, fitting the power law function to the high p_T spectra in different multiplicity and centrality classes. The comparison of the spectra of pp and Pb-Pb collisions at multiplicities corresponding to the same power law exponent exhibits marked differences at low momenta, namely, an increased contribution of low momentum particles, that could be attributed to the debris of the high momentum jets in Pb-Pb collisions. The claim is supported with studies of leading particle p_T production as well as its connection with the event activity and quenching properties. The connection to the respective energy densities will be discussed.

Content type

Theory

Collaboration

Centralised submission by Collaboration

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