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Quenching of Hadron Spectra in Heavy Ion Collisions at the LHC

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The p_{\perp} dependence of the nuclear modification factor R_{AA} measured in XeXe and PbPb collisions at the LHC exhibits a universal shape, which can be very well reproduced in a simple energy loss model based on the BDMPS medium-induced gluon spectrum. The scaling is observed for various hadron species (h^{\pm} , D , J/ψ) in different centrality classes and at all colliding energies, $\sqrt{s} = 2.76, 5.02, 5.44$ TeV. When comparing different systems, it is found that the average energy loss properly scaled by the particle multiplicity and the transverse area of quark-gluon plasma has a simple dependence on the path length traversed by the fragmenting partons. Based on this model, a data-driven procedure is suggested, which allows for the determination of the first and second moments of the quenching weight without any prior knowledge of the latter.

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