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Understanding basic features of parton energy loss from parametric modelling

Understanding the energy loss of partons traversing the strongly interacting matter created in heavy ion collisions is one of key goals of the heavy ion physics program. In this talk we present results of phenomenological analyses of various recent jet quenching data. The core of the model used in these analyses is based on the shift formalism which allows for an extraction of the magnitude of parton energy loss from the data with minimal assumptions on the underlying physics mechanisms. The model is capable of describing the full p_T, rapidity, and centrality dependence of the measured jet R_{AA} using three effective parameters. The analysis done using this simple model can explain the shape of the modification of fragmentation functions observed in the data as well as the relation between the magnitude of the jet R_{AA} and the R_{AA} of charged particles. The analysis of recent data on splitting functions and fragmentation functions allows for further constrains on the role of coherence effects in the parton energy loss. Further, the analysis of charmonia suppression using this model points to a remarkable similarity between the quenching of light-quark-initiated jets and the prompt charmonia suppression. In this talk, we also discuss possible explanations of intriguing features seen in the recently published dijet asymmetry measurement by ATLAS and differences in how fragmentation patterns are modified for inclusive jets compared to those in the gamma-jet system.

Summary

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