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Jet substructures and cross sections in proton and heavy ion collisions

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Jet substructures and cross sections provide crucial information about the jet formation mechanism. Their precise calculations are necessary for the understanding of the properties of the medium jets pass through. The calculations involve the resummation of large logarithms which can be performed using renormalization group techniques in soft-collinear effective theory. In heavy ion collisions, the jet-medium interactions are mediated by Glauber gluon exchanges which induce extra radiation. This causes the jet cross section suppression and jet broadening. I will discuss the framework and compare the calculations with the jet modification measurements in lead-lead collisions at the LHC with very good agreement.

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