Beitrag ID: **281** Typ: **Talk**

Energy Loss in Small Collision Systems

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We consider some corrections relevant to energy loss in small collision systems, for which the temperature times the size of the system isn't large, $T \times L \sim 1$.

First, we present the derivation of the explicit small path length correction to the DGLV opacity expansion. We then show first results from an energy loss model including these corrections, demonstrating the additional reduction in hadron suppression due to small collision systems (on top of the already reduced energy loss due to smaller pathlengths).

Second, we compute the NLO corrections to $\phi + \phi \to \phi + \phi$ scattering in ϕ^4 theory on a spacetime with finite spatial extent. We show first results for the finite system size corrections to the running coupling, $\lambda(p, L)$: the finite system size reduces the magnitude of the coupling at small scales, $p \sim 1/L$. The origin of the corrections to the running coupling are generic; QCD, with its negative beta function, should thus see an increase in the momentum dependence of hadron suppression from small system corrections to the running coupling.

Deriving the above NLO corrections requires several novel techniques of broader theoretical interest. Most important, we present denominator regularization, a procedure that has all the advantages of dim reg but that has multiple advantages over dim reg, including working in spacetimes of fixed dimensionality and without any symmetries.

Experiment/Theory

Theory/Phenomenology

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Track Klassifizierung: High momentum hadrons and correlations