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Extracting jet transport coefficient of cold nuclear matter

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Quantifying the differences between nuclear and hadronic collisions, phenomenological known as medium modification due to multiple scatterings between the hard probe and medium, can provide a solid baseline for unambiguous identification of the fundamental medium property. In this talk, we consider parton propagation in cold nuclear matter within the framework of high twist expansion, which has been shown to be a successful approach to describe the multiple scattering effect as observed in experiment. Through global analysis of world data on transverse momentum broadening of single particle, transverse momentum imbalance of two particle, as well as nuclear modification factor of single particle in electron-nucleus and proton-nucleus collisions, we perform the first extraction of jet transport coefficient (\hat{q}) for cold nuclear matter. This provide the first evidence that the medium transport property, rather than a constant value as commonly used in heavy ion collisions, depends on the probing scale similar to that in standard parton distribution functions of proton.

Additional comments

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