



Contribution ID: 12

Type: **not specified**

Cold Nuclear Matter effect on jet production at electron-ion colliders

Wednesday, 27 January 2021 12:55 (10 minutes)

Jet production and jet substructure at the electron-ion collider play an essential role in revealing the nuclear structure and the evolution of parton showers in cold nuclear matter. We present the theoretical study of inclusive jet cross section and jet charge with the cold nuclear matter effects at the EIC in the framework of soft-collinear effective theory with medium interactions. For the inclusive jet cross section we present the modification in electron-gold collisions in relative to electron-proton collisions, as well as its R dependence. We also provide the predictions of average jet charge for up-quark jet and inclusive jets. We demonstrate theoretically how to disentangle the effects from nuclear parton-distribution functions and the ones from strong interactions between cold nuclear matter and jet.

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Session Classification: Jets at EIC

Track Classification: Jets