



Contribution ID: 101

Type: **Oral**

PHYSICS AT FUTURE EIC EXPERIMENT

Thursday 10 September 2020 11:45 (20 minutes)

The future experimental facility EIC (Electron-Ion Collider) that will be built in Brookhaven National Laboratory in the USA introduces new opportunities for precise study in high energy nuclear physics. This contribution is an overview of the author's research related to this topic. Particularly, in this contribution, we focus on topics as nuclear shadowing, quarkonia wave function study, or exclusive and diffractive processes.

The goal is to study various nuclear effects, such as nuclear shadowing. Nuclear shadowing is a phenomenon of depletion of the cross section in comparison with a cross section on the proton target. The situation is more complicated since the interaction is not completely coherent at EIC kinematics, leading to more advanced formalism based on Green functions. The studied nuclear shadowing is universal and will be applied in fact to most of the processes on nuclear targets such as vector meson (VM) diffractive and, particularly, exclusive production. The goal in such measurement is to study gluon distribution or, generally, the universal gluon Wigner distribution. However, for that, we need to minimize the uncertainty from VM wave functions by its and its effects detailed study such as quark-antiquark potentials, Melosh spin rotation, or the structure of the VM vertex and the role of the D-wave component.

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Session Classification: Parallel sessions