

# Path integral treatment of coherence effects in charmonium production in nuclear ultra-peripheral collisions

Friday 19 July 2024 14:30 (15 minutes)

We present for the first time a revised study of charmonium production in nuclear ultra-peripheral collisions (UPC) based on a rigorous Green's function formalism. Such a formalism allows to incorporate properly effects of the color transparency, as well as the quantum coherence inherent in the higher twist quark shadowing related to the  $Q\bar{Q}$  Fock component of the photon. The significance of such effect gradually decreases towards forward and/or backward rapidities. In the LHC kinematic region we incorporate additionally within the same formalism the leading twist gluon shadowing corrections related to higher multi-gluon photon fluctuations. They represent a dominant source of nuclear phenomena in the mid-rapidity region. Model predictions for the rapidity distributions  $d\sigma/dy$  are in a good agreement with available UPC data on coherent and incoherent charmonium production at RHIC and the LHC. They can be also verified by future measurements at the LHC, as well as at EIC.

## Alternate track

## I read the instructions above

Yes

**Authors:** NEMCHIK, Jan (Czech Technical University in Prague (CZ) and Institute of Experimental Physics, Kosice (SK)); Dr OBERTOVA, Jaroslava (Faculty of Nuclear Science and Physical Engineering, Czech Technical University in Prague)

**Presenter:** Dr OBERTOVA, Jaroslava (Faculty of Nuclear Science and Physical Engineering, Czech Technical University in Prague)

**Session Classification:** Strong interactions and Hadron Physics

**Track Classification:** 06. Strong Interactions and Hadron Physics