

Exclusive photoproduction of charmonium-photon pairs in the small-x kinematics

Friday, 5 December 2025 09:30 (0:20)

Content

In this talk we present our results for $\eta_c\gamma$ and $\chi_{cJ}\gamma$ exclusive photoproduction in the high-energy kinematics, which can be studied at the LHC and the future Electron Ion Collider (EIC). Due to onset of the saturation in the small-x region, the interaction of heavy quarks with gluonic field of the target is described in the Color Glass Condensate (CGC) framework. We found that the cross-sections of the suggested processes in the leading order in the strong coupling constant are fully determined by the dipole scattering amplitude and thus may be used as a tool to study of different parametrizations of this fundamental phenomenological object.

We estimated numerically the cross-sections and the expected counting rates in the kinematics of high-energy photoproduction experiments which can be realized at future EIC or in the ultraperipheral collisions at LHC, and found that the cross-sections are sufficiently large for the dedicated experimental study.

We also estimated the role of these processes as a potential background to η_c and χ_{cJ} photoproduction, which are among the possible tools for studying t -channel odderon exchange. We found that $\eta_c\gamma$ and $\chi_{cJ}\gamma$ production with undetected photon are on par with expected contribution of odderon in the kinematics of small momentum transfer.

This talk is partially based on publication Phys.Rev.D 111 (2025) 5, 056024 (<https://doi.org/10.1103/PhysRevD.111.056024>)

Primary author(s) : Mr. ZEMLIAKOV, Ivan (UTFSM); SIDDIKOV, Marat (UTFSM); ROA, Michael (UTFSM)

Presenter(s) : Mr. ZEMLIAKOV, Ivan (UTFSM)