



Contribution ID: 90

Type: **Oral presentation**

## Exclusive vector meson production at high energies and gluon saturation

*Tuesday 29 April 2014 15:00 (20 minutes)*

We investigate exclusive diffractive photoproduction of vector mesons ( $J/\psi$ ,  $\phi$  and  $\rho$ ) off protons in high-energy collisions. We confront saturation-based results for diffractive  $J/\psi$  photoproduction with all available data including recent ones from HERA and LHCb. We show that while the total  $J/\psi$  cross-section is affected by uncertainties related to the charm mass, the  $t$ -distribution of differential cross-section offers a unique opportunity to unambiguously discriminate among saturation and non-saturation models. This is due to emergence of a pronounced dip (or multiple dips) in the  $t$ -distribution of diffractive photoproduction of vector mesons at relatively large  $|t|$  that can be traced back to the unitarity features of colour dipole amplitude in the saturation regime. We show that in saturation models the dip in the  $t$ -distribution recedes towards lower  $|t|$  with decreasing mass of the vector meson, increasing energy or decreasing Bjorken- $x$ , and decreasing virtuality  $Q$ . We provide predictions for exclusive photoproduction of various vector mesons at the LHC and at future electron-proton colliders.

This talk is mainly based on: [arXiv:1402.4831](https://arxiv.org/abs/1402.4831).

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**Session Classification:** WG7: Future experiments

**Track Classification:** WG7: Future experiments