

UPC 2023: International workshop on the physics of Ultra Peripheral Collisions

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Saturation effects in exclusive heavy vector meson photoproduction at the LHC

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The gluon density has been observed to increase rapidly with energy, which would eventually violate unitarity. At high energies, however, nonlinear effects start to become important, slowing down the evolution of the gluon density and hence giving rise to gluon saturation. While there have already been strong hints of saturation in the currently available data, a definite measurement of saturation is still lacking. As exclusive vector meson production is expected to be sensitive to saturation, it offers one possible channel for measuring saturation.

The purpose of this talk is to study the magnitude of saturation effects in exclusive heavy vector meson photoproduction at the LHC. This is done by comparing predictions from linear and nonlinear models for the evolution of the gluon density. The difference in these models is the high-energy evolution of the dipole amplitude, which is done according to the BFKL and BK equations respectively. This allows us to quantify the effects of saturation in this process and determine whether saturation can be measured at the LHC.

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