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Helicity flip transitions and the t-dependence of exclusive photoproduction of rho meson

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We calculate the differential cross section dσ/dt for the diffractive photoproduction process γp⟶ρp and compare to recent data extracted by the CMS collaboration. Our model is based on two-gluon exchange in the nonperturbative domain. We take into account both helicity conserving and often neglected helicity-flip amplitudes in the γ⟶V transition, which can contribute at finite t. The shape of the differential cross section as well as the role of helicity flip processes is strongly related to the dependence of the unintegrated gluon distribution on transverse momenta in the nonperturbative region. Results for different unintegrated gluon distribution will be shown. The presentation will be based on paper published recently [1].

[1] A. Cisek, W. Schäfer, A. Szczurek, „Exclusive production of rho meson in gamma-proton collisions: dσ/dt and the role of the helicity flip process"; Phys. Lett. B836 (2023) 137595.

Collaboration

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