

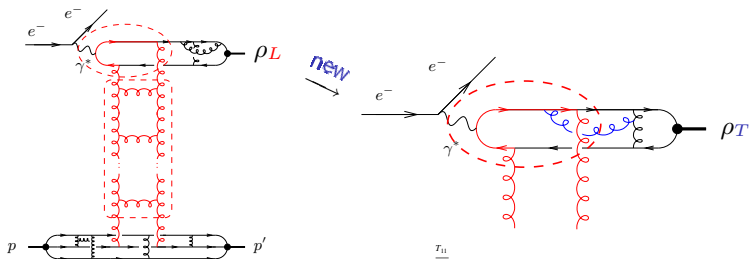
Exclusive vector meson production with tagged out-going p/A

Samuel Wallon

Université Pierre et Marie Curie
&
Laboratoire de Physique Théorique
CNRS / Université Paris Sud
Orsay

in collaboration with

I. V. Anikin (JINR, Dubna), A. Besse (LPT, Orsay), D. Yu. Ivanov (SIM, Novosibirsk),
B. Pire (CPhT, Palaiseau) and L. Szymanowski (NCBJ, Warsaw)

Diffractive exclusive process $e^- p \rightarrow e^- p \rho_{L,T}$ 

first description combining beyond leading twist

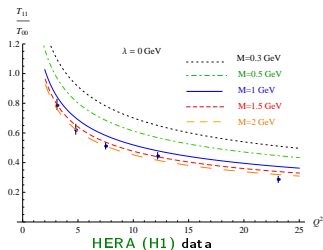
- collinear factorisation
- k_T -factorisation

I. V. Anikin, D. Yu. Ivanov, B. Pire, L. Szymanowski, S.W.

Phys.Lett.B682 (2010) 413-418

Nucl.Phys.B828 (2010) 1-68

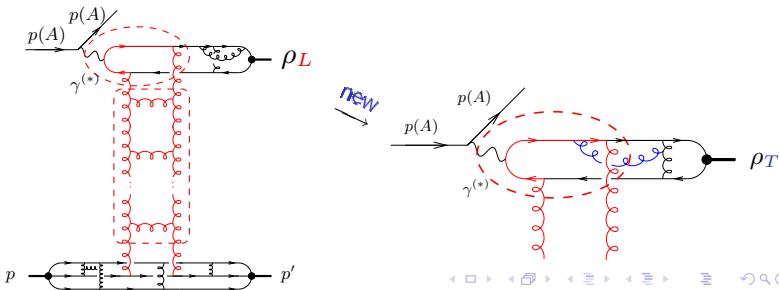
HERA, LHeC project



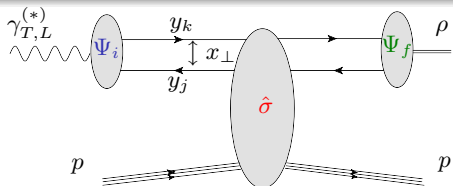
I. V. Anikin, A. Besse, D. Yu. Ivanov, B. Pire,
L. Szymanowski, S.W.
Phys.Rev. D84 (2011) 054004

Diffractive exclusive process $p(A)p \rightarrow p(A)p\rho_{L,T}$

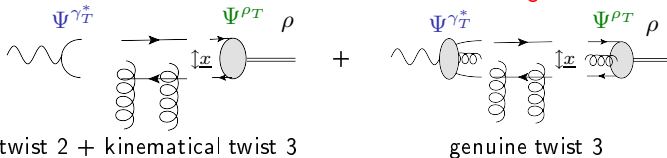
- For large impact parameter, γ exchange from $p(A)$ dominates the pure strong-interaction processes: **Ultra-Peripheral Collisions**
 - Coulomb pole for UPC $1/p_T^2$ versus $\exp(-B p_T^2)$ for strong interaction events
 - in heavy ion mode, detection of neutrons produced by the giant dipole resonance as a signal of UPC
 - γ , i.e. $\gamma^*(Q^2)$ with $Q^2 \simeq 0$ strongly dominates the Weizsäcker-Williams spectrum
 - **Hard scale = $-t$**
- Can one tag the outgoing p or A in order to get access to $\gamma^*(Q^2)$ with $Q^2 \gg \Lambda_{QCD}^2$ at LHC?



Dipole representation and saturation effects



- Initial Ψ_i and final Ψ_f states wave functions of projectiles
- Universal scattering amplitude $\hat{\sigma} \equiv \hat{\sigma}_{\text{dipole-target}}$ Golec-Biernat Wusthoff
 - color transparency for small x_\perp : $\hat{\sigma}_{\text{dipole-target}} \sim x_\perp^2$
 - saturation for large $x_\perp \sim 1/Q_{\text{sat}}$: $T < 1$
- The dipole representation is consistent with the twist 2 Collinear approximation
- **New: still consistent with collinear factorization at higher twist order:**



A. Besse, L. Szymanowski, S. W., to appear

γ case for large $|t|$?
Phenomenology?