Photoproduction of a meson-photon pair at large invariant mass

F.-X. Girod

Jefferson Laboratory / UConn

Mar 7th 2019



CLAS12 DV ϕ





Outline















Motivations: $\rho_L \gamma$ channel

Processes with 3 body final states can give access to chiral-even GPDs



chiral-even twist 2 GPD



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Motivations: $\rho_{T}\gamma$ channel

Processes with 3 body final states can give access to chiral-odd GPDs



chiral-odd twist 2 GPD



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Motivations: $\pi^+\gamma$ channel

Processes with 3 body final states can give access to chiral-even GPDs



chiral-even twist 2 GPD



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Projections: $\rho_{L}\gamma$ channel

Chiral even cross section

at $-t = (-t)_{\min}$





neutron target

$$S_{\gamma N} = 20 \text{ GeV}^2$$

 $M_{\gamma \rho}^2 = 3, 4, 5, 6 \text{ GeV}^2$



Projections: $\rho_{L}\gamma$ channel

Chiral even cross section



 $S_{\gamma N}$ vary in the set 8, 10, 12, 14, 16, 18, 20 GeV² (from left to right)

typical JLab kinematics

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Projections: $\rho_{T}\gamma$ channel

Chiral odd cross section

at $-t = (-t)_{\min}$



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 $S_{\gamma N} = 20 \text{ GeV}^2$ (LAS12 DV ϕ 07/03/19 7/15

Projections: $\rho_{T}\gamma$ channel

Chiral odd cross section



 $S_{\gamma N}$ vary in the set 8, 10, 12, 14, 16, 18, 20 GeV² (from left to right)



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- QCD collinear factorization established; firm grounds
- model calculations available
- large statistics predicted for CLAS12
- natural extension of the GPD program, complementary sentivities
- probe chiral even and chiral odd GPDs with the same reaction

Next we show the statistics obtained from 6 runs starting at 5000 10.6 GeV inbending



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Kinematics $\pi^+\gamma$ channel





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PID $\pi^+\gamma$ channel



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Exclusive $\pi^+\gamma$ channel





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Kinematics $\rho\gamma$ channel



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PID $\rho\gamma$ channel



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Exclusive $\rho\gamma$ channel





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- Promising new GPD probe to complement CLAS12 exclusive program
- Encouraging statistics
- Questions about exclusivity after alignment
- Next steps: start simulations
- Ref.: JHEP 1702 (2017) 054 (arXiv:1609:03830)





