Exclusive reactions working group summary

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EIC YR Workshop, Temple



Program at Temple meeting 1

All sessions including a lot of discussions!

Thursday: DVCS, π^0

- S. Fazio Summary of available DVCS and GPDs impact studies in e+p at EIC — MILOU code, luminosity requirements, t-resolution
- FX Girod DVCS and π^0 Simulation focus on π^0 vs. γ resolution
- S. Liuti DVCS analysis framework GPD extraction theory

Friday 1st session: VM, dijet

- S. Joosten Summary of available studies on VMP in e+p collisions at EIC

 in pretty good shape here
- T. Ullrich Summary of studies and challenges for VMP in e+A collisions
 Clear detector issue on electron p_T resolution vs. detector handbook
- H. Mäntysaari Exclusive di-jet production and gluon Wigner function
 Active theory topic, but MC implementation needs to be discussed
- ▶ J. Wagner TCS with PARTONS new process being implemented for MC

Program at Temple meeting 2

Friday 2nd session: general physics

- A. Tandogan $N \rightarrow N^*$ transition GPDs
- C. Weiss Discussion on kinematical reach, Process by process:
 - ▶ How high x needed? Overlap with JLab, dispersion relations ... \implies Need to quantify how strong is case low \sqrt{s} running.
 - > Varying opinions on how high |t| required for physics (Fourier-transform).
 - Positrons (even unpolarized) ? Need dedicated discussion btw machine and physics.

Joint with Diffractive/Tagging and Forward Detectors / IR groups

- C. Weiss Effect of beam smearing on tagging/accessible t-range
- ► T. Ullrich Requirements on tracking from VMP in e+A (see above)
- A. Jentsch Current simulation results with IR + detectors
 Far forward detectors, magnets in simulations of *ep* and *eD* DVCS
- S. Klein Separating Coherent and Incoherent Interactions
- ► T. Horn Meson structure functions (forward) detector requirements

- During Temple meeting we have been refining our list towards a table of benchmarks processes.
- ▶ In exclusive processes fwd detection important ⇒ ep, eA very different!
- Contact people in this table: still evolving.

Process	Detector challenge	Key plot	Physics goal	Contacts
DVCS (<i>ep</i>) including polarization + positrons?	tracker, EMCAL cov- erage (e/ γ separation, reso- nance bkg.) EMCAL granularity (γ vs π^0 bkg.) fwd <i>h</i> acceptance (for extended <i>t</i> -range) full 2π hermeticity (spin asymmetries)	$rac{d\sigma/dt}{A_{UT}} \pi^0$ decay- γ : $\Delta(heta)$	proton GPDs <i>D</i> -term Ji sum rule	D. Sokhan S. Fazio F.X. Girod R. Duprè K. Kumericki B. Pasquini S. Liuti PARTONS group

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Process	Detector challenge	Key plot	Physics goal	Contacts
Coherent DVCS on D, ³ He, ⁴ He	t acceptance in fwd spectrometer	dơ/dt	nuclear GPDs	R. Dupré S. Scopetta S. Liuti, PARTONS group
DVCS on neutron: Double tagging on D	ZDC acceptance (<i>n</i> tagging) ZDC, VTX resolution (<i>t</i> reconstruction) spectator proton (RPs acceptance)	$d\sigma/dt$ for n DVCS (kinematics from tagging n and p)	neutron GPD GPD flavor separation	Z. (Kong) Tu A. Jentsch S. Niccolai D. Sokhan

Process	Detector challenge	Key plot	Physics goal	Contacts
TCS (and J/Ψ) in <i>ep</i>	e [±] p-resolution fwd (<i>h</i> -going) coverage for decay leptons (near-threshold)	dø/dt for TCS and J/Ψ	GPDs, proton mass/trace anomaly (near thresh- old)	S. Joosten Z.E. Meziani S. Klein E.C. Aschenauer S. Fazio M. Boer PARTONS group
exclusive ϕ and ρ in ep (and eA)	PID for hadronic decay channels: kaons	dơ/dt	GPDs, gluon saturation	PARTONS group
exclusive π^0 and π^+	PID, EMCAL resolution and granularity for π^0 decay	dơ/dt	GPDs (chiral- odd and chiral-even)	PARTONS group

Process	Detector challenge	Key plot	Physics goal	Contacts
J/Ψ (+ other VM's) in <i>eA</i>	fwd instrumentation (veto incoh. bkgd. in eA) hermeticity (rapidity gap) p_T -resolution for decay e^{\pm}, μ^{\pm} *	dσ/dt	saturation & shadowing nGPDs	T. Ullrich T. Toll V. Guzey
diffractive dijets (diff. structure functions)	jet p_T resolution (need to connect with jet, SIDIS subgroups)	$d\sigma/d\phi$ (angle btw recoil momen- tum and jet axis) for different <i>t</i> , jet p_T 's	elliptic gluon Wigner distri- bution	Y. Hatta H Mäntysaari B. Pasquini E.C. Aschenauer