

Inclusive reactions WG

Conveners:

Renee Fatemi (Kentucky)

Nobuo Sato (JLab)

Barak Schmookler (Stony Brook)

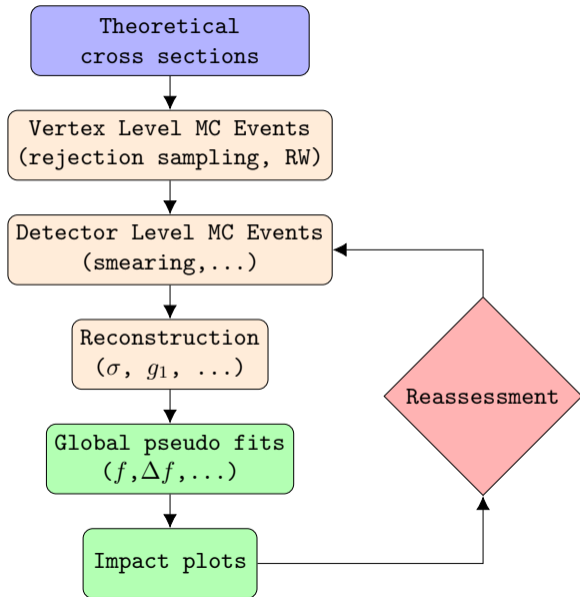
1st EIC Yellow Report Workshop at Temple University

The workforce

Topics	Theorists	Experimentalists
Polarized PDFs	Francesco G. Celiberto, Harleen Dahiya, Daniel de Florian, Filippo Delcarro, Jacob Ethier, Wally Melnitchouk, Emanuele Nocera, Juan Rojo, Rodolfo Sassot, Nobuo Sato, Christian Weiss, Werner Vogelsang	Elke-Caroline Aschenauer, Xiaoxuan Chu, Abhay Deshpande, Renee Fatemi, Krishna Kumar, Nickolas Lukow, Jae Nam, Matt Posik, Amilkar Quintero, Bernd Surrer, Barak Schmookler
Unpolarized PDFs	Alberto Accardi, C.-P. Yuan, Daniel de Florian, Emanuele Nocera, Francesco G. Celiberto, Giuseppe Bozzi, Harleen Dahiya, Jacob Ethier, Rabah Abdul Khalek, Juan Rojo, Pavel Nadolsky, Rodolfo Sassot, Tim Hobbs, Wally Melnitchouk	Astrid Morreale, Bernd Surrer, Amilkar Quintero, Matt Posik, Jae Nam, Nickolas Lukow, Xiaoxuan Chu, Elke-Caroline Aschenauer, Barak Schmookler
Nuclear PDFs	Emanuele Nocera, Rabah Abdul Khalek, Pia Zurita, Wally Melnitchouk, Pavel Nadolsky, Tim Hobbs, Jacob Ethier, Hannu Paukkunen, Juan Rojo, Carlota Andres, Michal Krelina	Astrid Morreale, Renee Fatemi, Bernd Surrer, Amilkar Quintero, Matt Posik, Jae Nam, Nickolas Lukow, Elke-Caroline Aschenauer, Xiaoxuan Chu
Non-linear QCD	Juan Rojo, Christian Weiss, Nobuo Sato	Elke-Caroline Aschenauer, Abhay Deshpande, Michal Krelina
Electroweak & BSM	Giuseppe Bozzi, Tim Hobbs, Enrico Lunghi, Nathan Sherrill, Werner Vogelsang	Elke-Caroline Aschenauer, Abhay Deshpande, Renee Fatemi, Krishna Kumar, Caryn Palatchi

General Plan

- Theorists will produce theoretical cross sections
- Event level MC events (full final state) will be produced to match theory cross section
- Detector level MC event will be generated (acceptance, resolution, PID efficiencies)
- Target cross sections/asymmetries will be reconstructed
- Pheno groups (CJ, JAM, NNPDF,...) will carry out global fits using pseudo EIC data



Measurement	Main Detector Requirements	Anticipated Plot	Physics Topic/goal	Responsible persons	Additional Comment
A_{\parallel}, A_{\perp} for $p, d, {}^3\text{He}$	Standard inclusive	$A_{\parallel}, A_{\perp}, g_{1,2,\perp}, \Delta g$	Gluon & Quark Helicity and HT	TBA	Global fit with SIDIS?
$A_{\text{PV}}^e, A_{\text{PV}}^h$ for p, d	Standard inclusive	$A_{\text{PV}}^e, A_{\text{PV}}^h, F_{2,3}^{\gamma Z}, g_{1,5}^{\gamma Z}, F_{2,3}^{W^-}, g_{1,5}^{W^-}, (\Delta)s^+$	Pol. & Unpol. strange	TBA	Will SIDIS do the Kaon tagging channel?
$d\sigma^{\text{NC}}/dxdy$ (inc, HQ) for p, d	Standard inclusive + heavy quark	$\sigma_{\text{red}}^{\text{inc.,HQ}}, F_{2,L}^{\text{inc.,HQ}}, g, d/u$	Proton PDFs	TBA	Global fit with SIDIS?
$d\sigma^{\text{NC}}/dxdy$ (inc, HQ) for A	Standard inclusive + heavy quark	$\sigma_{\text{red}}^{\text{inc.,HQ}}, F_{2,L}^{\text{inc.,HQ}}, F_2^A/F_2^N, g,$	Nuclear PDFs	TBA	
$d\sigma^{\text{NC}}/dxdy$ (inc) for p, A	Standard inclusive	$\sigma_{\text{red}}^{\text{inc.,HQ}}, F_{2,L}^{\text{inc.,HQ}}$	Non-linear QCD dynamics	TBA	Global fit with SIDIS?
A_{PV}^e for d	Standard inclusive	$\sin^2(\theta_W)$	BSM & precision EW physics	TBA	Need $\sim 100 \text{ fb}^{-1}$ CLFV via $e \rightarrow \tau$?
$d\sigma^{\text{NC}}/dxdy d\phi$	Standard inclusive	Updated Fig.6 in PhysRevD.98.115018 for CM energies smearing	Lorentz and CPT Violating Effects	Lunghi and Sherrill	

Next Steps

- Discuss procedures to generate vertex level events consistent with theory cross sections
- Discuss detector parameters (smearing, resolution, PID deficiencies)
- Discuss the workforce for each parts:
1) cross section generation, 2) vertex level MC, 3) detector simulation, 4) reconstruction and 4) pheno.

