Some general comments and channel discussion

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Guidance from Physics Conveners

- Energies and species based on BNL design study (https://wiki.bnl.gov/eic/upload/EIC.Design.Study.pdf), some questions such as ed, same energies for ep and eAu, etc to be discussed at Temple meeting
- p-e: 275 on 18 GeV, 100 on 10 GeV, 100 on 5 GeV and 41 on 5 GeV
- Au-e: 110 on 18 GeV, 110 on 10 GeV and 41 on 5 GeV

- For integrated luminosity, we could follow similar assumptions as in the White Paper, i.e.: 10 fb^{-1} and 100 fb^{-1}.
- A polarization of 70% can be assumed for electrons and light ions as a baseline

Status

- Some simulations have started on generator+smearing level, more realistic smearing, especially PID response and mis-id and effects from B-Field still need to be added.
- Finally, Wiki became available: https://wiki.bnl.gov/eicug/
  - Will put all the relevant information (ie the table of our analysis channels, etc.) there soon
  - Modification limited to co-conveners – if you think some important aspect may be missing, contact us.
  - Wiki will eventually link to relevant files (to be kept in EICUG Dropbox account)

Quark Sivers, 3D momentum structure, TMD evolution

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
quark Sivers/other TMD measurements using single hadrons: quark Sivers, TMD evolution, 3D momentum structure, Tensor charge	Alexey Vladimirov, Miguel Echevarria, Xiaqing Li, RCS, Alexei Prokudin, Elke, Harut, Andrea Signori, Filippo Delcarro, Daniel Pitonyak, Pavia group, JAM, Calgiari, Osvaldo, Leonard, Elena, Ted Rogers, Hayan	3D image (x,kt) of the Sivers Function, Evolution test of Sivers at intermediate x	pseudo-3D Sivers function as a function kt for various x bins, Value of Tensor charge uncertainties + plot vs x, Q2 dependence of Sivers function or AUT at fixed x	eta acceptance for hadrons, angular resolution, granularity of the detector (central to forward -1 to 4),pi/K/p identification	start with Sivers function, then Collins, also need unpolarized TMDs, combined fits for unpol and pol TMDs/FFs	extraction of Qiu/Sterman function and uncertainties

Gluon Sivers via di-jets/di-hadrons

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
Gluon Sivers via di-hadron/di-jet measurements () --> check overlap with jet/HF group	Bowen, JH Lee, Elke, Pavia gluon Sivers model, Cagliari, Zhongbo	Probing the size of the gluon Sivers function	Size of the asymmetry as a function of x	acceptance for back-to-back dihadrons	Likely model independent, could use generic generator	

Spectroscopy possibilities

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
Representative spectroscopy channel : X,Y → J/Ψππ, DD* → check with exclusive and HF groups	Justin, JLab, FSU, JPAC, Indiana, Edinburgh/Glasgow	Demonstrate opportunities in spectroscopy	Kinematic coverage for decay particles in representative channels	Particle ID, Vertex (open charm),	Generator, EICsmear for mass resolution etc., bkgd. estimation	Expected limits on coupling vs mass for J/Ψππ, DD* final states

Sea quark helicity measurements

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
Sea quark helicity measurements via SIDIS (and CC DIS)	RCS + Elke's group, Rodolfo Sassot, Ignacio Borsa, other fitters, Yuxian Zhao	flavor separated (anti)quark helicity distributions over wide range of x	Update of previous sea quark helicity PDF uncertainty plots	hadron momentum and energy resolution in forward direction (2-4) for CC events	Combined fits of PDFs/FFs/helicities?	

FFs/nFFs/nPDFs via single hadron FF

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
Single hadron fragmentation functions for ep and eA for FFs, nFFs, nPDFs ()	Valerio Bertone, Pia Zurita, Elke+Charlotte, Will Brooks, Kawtar, RCS		nPDF uncertainty expectation, (n)FF expectation			

Di-hadron correlations in eA →low x

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
Di-hadron correlations in eA for onset of saturation effects → WW gluons	Bowen, JH Lee, Elke, etc	Probing the onset of saturation phenomenon	decorrelation plot as in white paper	backward hadron acceptance, granularity		

Di-hadron FF for Tensor charge/Boer-Mulders

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
Di-hadron fragmentation related Tensor charge/ Boer Mulders measurements	Anselm, Chris Dilkes,+Duke Grad, Marco Radici, Alessandro Bacchetta,Valerio Bertone		Tensor charge uncertainties for dihadron extraction, BM asymmetry projections based on MC	likely similar to quark Sivers, coverage to low momenta (for partial wave decomposition)		

Lambda related spin measurements

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
Lambda related spin structure measurements	Chris Dilks, Jinlong, Daniel Boer, Werner, Feng, Leonard, Schlegel, Anselm	Twist 3 function, TMD, but also D_{LL},D_{TT}	Uncertainty estimates for polarization dependent variables	Vertex requirements? proton ID, low momentum coverage, mass resolution (feed down)	Λ vs anti Λ ratio (fragmentation check)	

Hadron in jet measurements

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
Hadron in jet and jet only measurements for TMDs (in close collaboration with jet/HF working group)	Miguel Arratia, Alexei Prokudin, Zhongbo, Felix, Nobuo, HF/jet working group	possibility of cleaner Sivers extraction, substructure measurements				

Heavy flavor pair measurements for gluon Sivers

Channel	Workforce (responsible co-convener in red)	Goals	Money plot	Detector requirements	Comments /strategy	bonus plots
HF pairs to access gluon Sivers	HF/jet working group, Cagliari, Alessandro,	Gluon Sivers function				