

Update on preTDR suggested outline for Chapter 4 (from PACs after feedback from EB)

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4 Detector Performance for the EIC physics program

4.1 ePIC and the Science case of the EIC

4.1.1 Connecting the Physics Processes to the NAS Science Pillars

4.2 Global Performance Considerations

4.2.1 Electron Identification

4.2.2 Muon Identification

4.2.3 Photon Identification

4.2.4 Hadron Identification

4.2.5 Jet Reconstruction and Calibration

4.2.5.1 Jet Energy Scale and Resolution

4.3 Incorporation of Beam Backgrounds in the Studies

4.4 Physics Processes and Detector Performance

4.4.1 Inclusive processes

4.4.1.1 Methods and Reconstruction of Inclusive kinematics

4.4.1.2 Detector Impact on key Inclusive physics measurements

4.4.1.3 Influence of beam Background on Inclusive measurements

4.4.2 Semi-Inclusive processes

4.4.2.1 Methods and Reconstruction of SIDIS kinematics

4.4.2.2 Detector Impact on key SIDIS physics measurements

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4.4.3 Exclusive and Diffractive processes

4.4.3.1 Methods and Reconstruction of Diffractive kinematics

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4.4.3.3 Influence of beam on Background on Exclusive measurements

4.4.4 Hard Probes

4.4.4.1 Heavy Flavor reconstruction

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4.4.4.3 Detector Impact on Key Heavy Flavor Physics Measurements

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4.4.4.5 Jets as a Hard Probe

4.4.4.6 Detector Impact on Key Jet Physics Measurements

4.4.4.7 Influence of beam on Background on Jet measurements

- With thanks to the EB for the feedback and advice we have changed the outline
- We believe it is an improved outline for the narrative of the preTDR and that it also provides more clarity than previously on who should contribute to each section

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Science case and link to NAS pillars presented up front

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No performance yet, but make clear the links between the pillars and the different processes in following sections

Table mapping out the processes and links to science can go here

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Tools for analysis and their performance, verifying detector design

Placed here since several tools are relevant/used for more than one processes

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Assigning people to these subsections will be straightforward, most of text is already produced and can be refined

We are in close contact with reconstruction group on some of these topics and will continue to collaborate with them as such

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Will refer to the other section in technical chapter and here only provide details of how beam background is embedded in the physics simulations which follow

Can also introduce E-pz here

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Division into key processes

Info on the reconstruction of each process

Performance of detector wrt the different key types of processes and impact of detector on key plots

Effect of background on processes presented

Jets and HF combined into “Hard Probes” sections and displaced vertex/tracking added for that physics too