DetectorWG/Inclusive/SIDIS/Jet/HF Meeting

Inclusive Reactions Group

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Major Detector Requirements/Resolutions as specified by the EIC Detector Handbook.

1) Reasonable π suppression as a function of η?

2) e- detection efficiencies?

3) Kaon reconstruction efficiencies?

- Scattered e^- ID for $|\eta_e| < 4$ with π suppression of $1{:}10^4$. High Q^2 electrons are back-scattered up to $\eta_e = 2$ so effectively π/e discrimination is only required from $-4 < \eta_e < 2$.

- Required scattered lepton energy resolution:

$\%\sigma_{E_e}/E_e$	η_e low	η_e high
2	-4.5	-2.0
7	-2.0	-1.0
10-12	-1	4.5

- Scattered lepton and charged hadron momentum resolution

$\%\sigma_{p_e}/p_e$	η_e low	η_e high
$2.0 + 0.10p_e$	-3.5	-2.5
$1.0 + 0.05p_e$	-2.5	-1.0
$0.05 + 0.05p_e$	-1	1.0
$1.0 + 0.05p_e$	1.0	2.5
$2.0 + 0.10p_e$	2.5	3.5

- Scattered lepton angle resolution is constrained by energy and momentum resolutions if calculated from Q^2.

- Need reconstruction of tagged Kaons from D meson decay for $|\eta_K| < 3$, $p_K < 10$ GeV and 1% background/signal dilution. This requires secondary vertex reconstruction via a high resolution μ vertex detector. Current e_K dependent momentum limits:

p GeV/c	η_K low	η_K high
≤ 7	-3.5	-1.0
≤ 5	-1.0	1.0
≤ 8	1.0	2.0
≤ 25	2.0	3.0
≤ 45	3.0	3.5