

VM Production of $\phi \rightarrow K^+ K^-$

Samuel Heppelmann

UC Davis & LBNL

eSTARlight in EICRoot

LBNL All-Silicon Detector

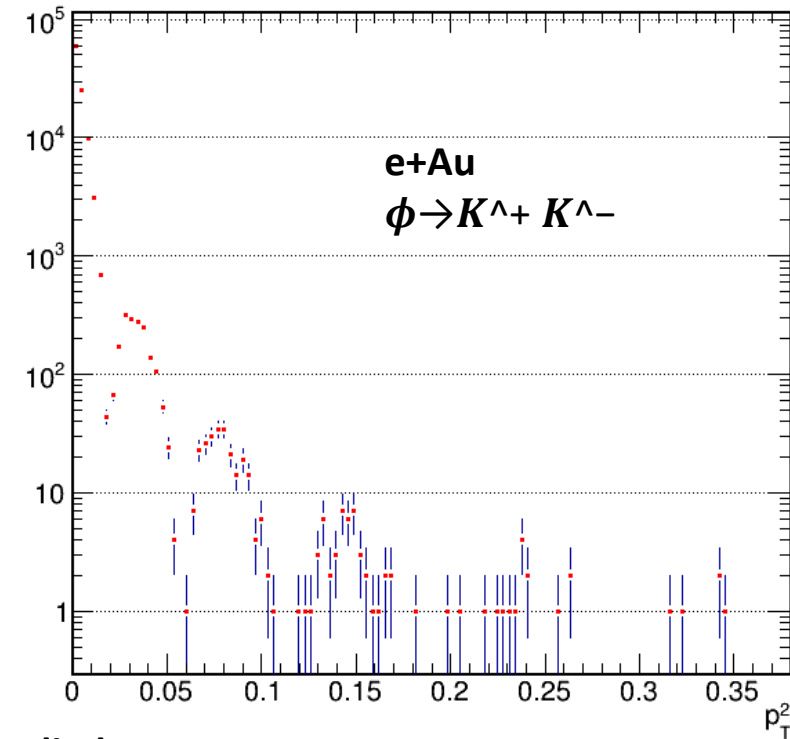
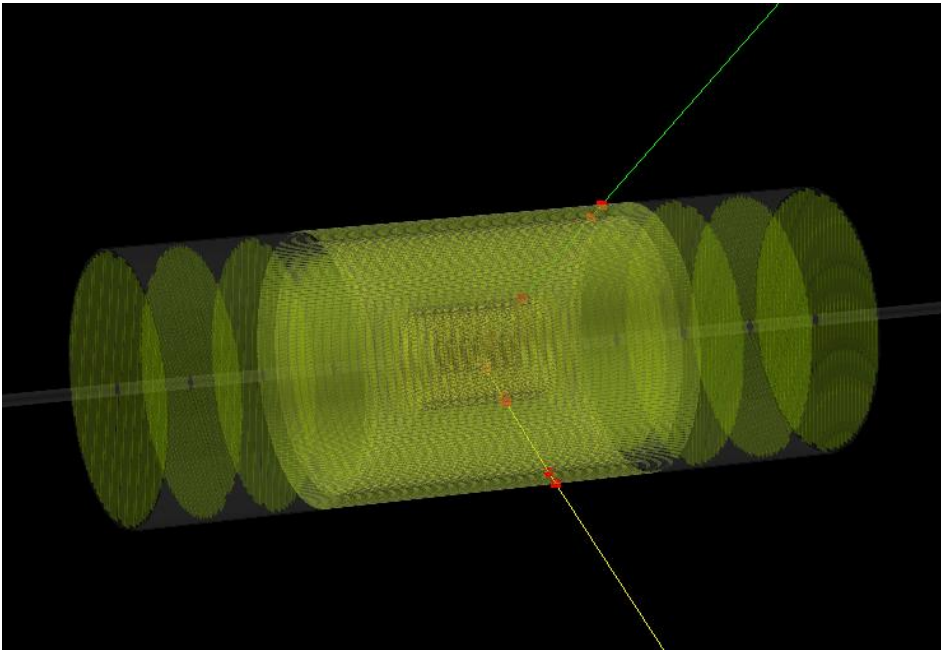
(Developed by LBNL's eRD16 generic EIC detector project)

- Silicon Tracker

6 layers

- Silicon Endcap Disks

6 disks



Systems studied:

Collider configurations:

Electron (18 GeV) on Au (100 GeV) for and

Electron (18 GeV) on protons(100 GeV)

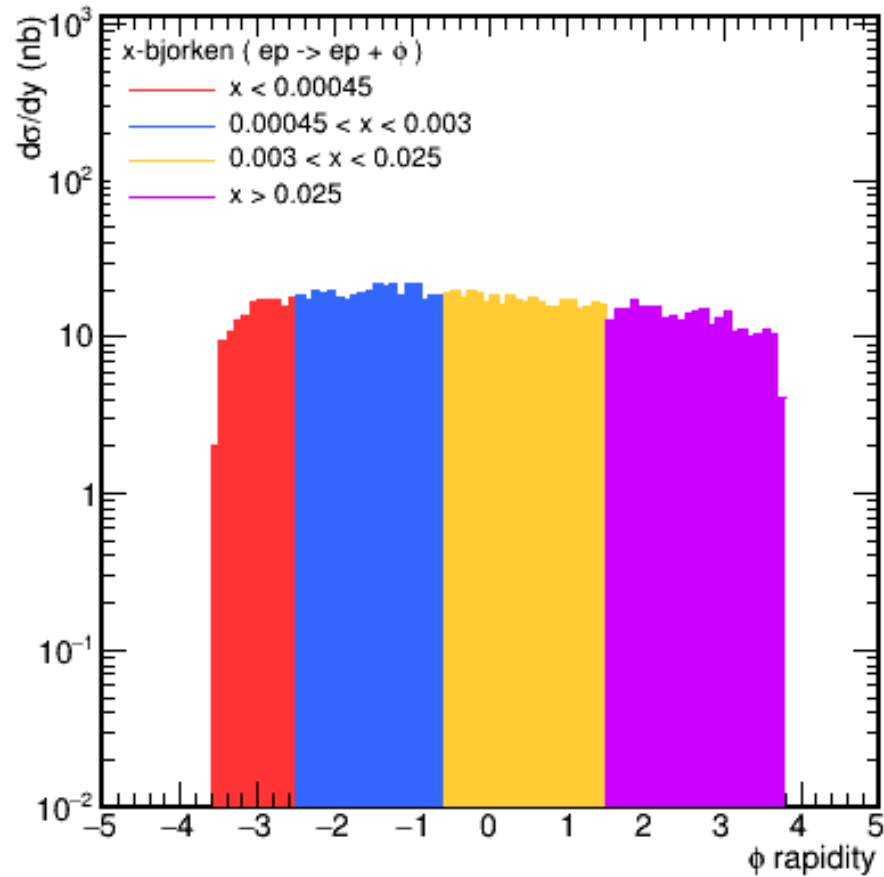
Vector Mesons:

$\phi \rightarrow K^+ K^-$

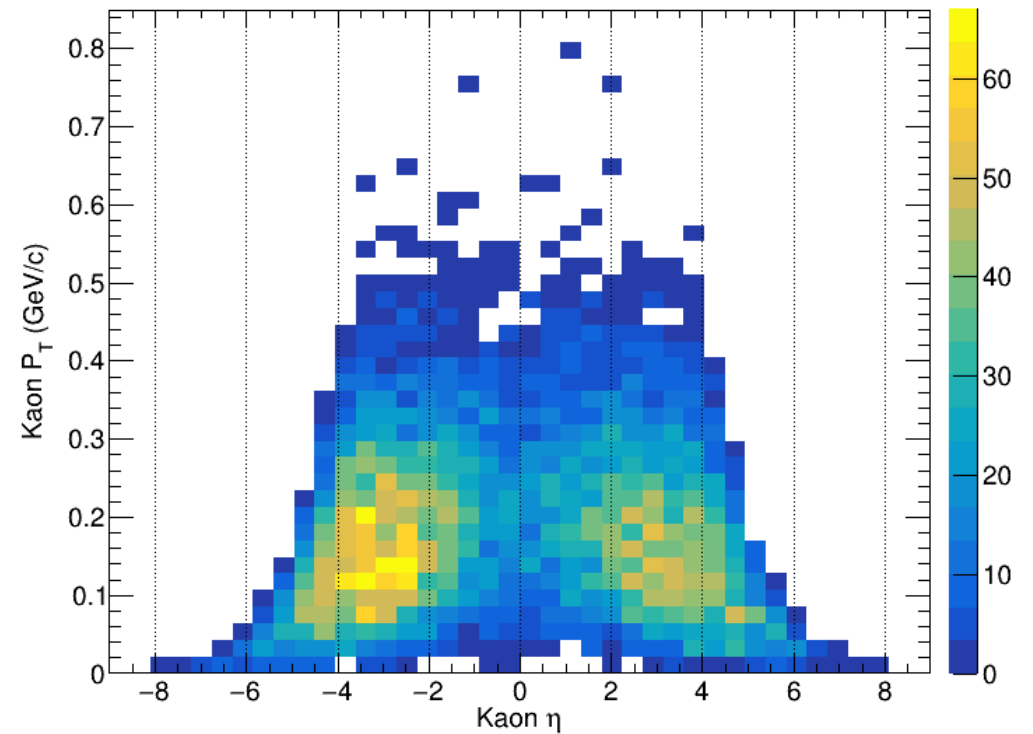
$\phi \rightarrow K^+ K^-$ in eSTARlight

18 GeV Electron

100 GeV Proton



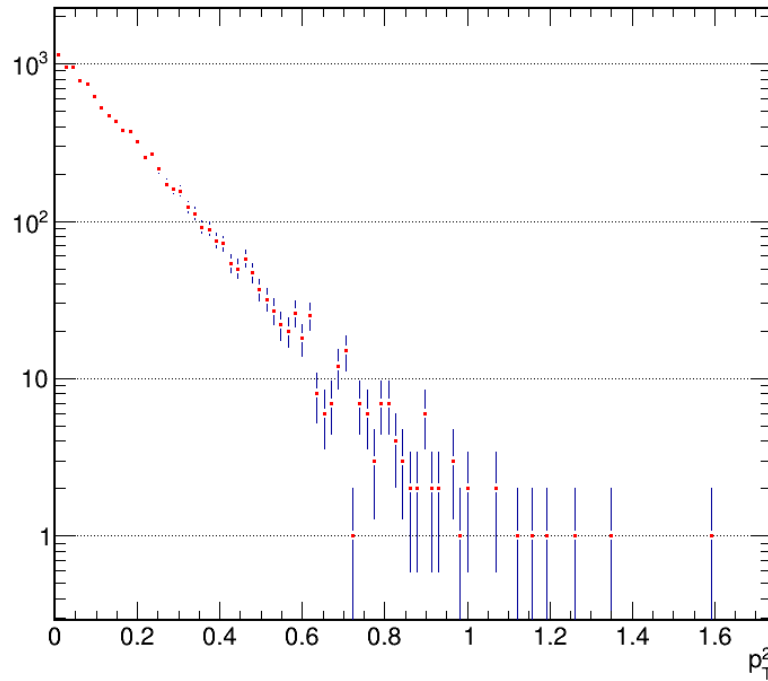
Electron (18 GeV) on Proton (100 GeV)
($0 < Q^2 < 100 \text{ GeV}^2$)



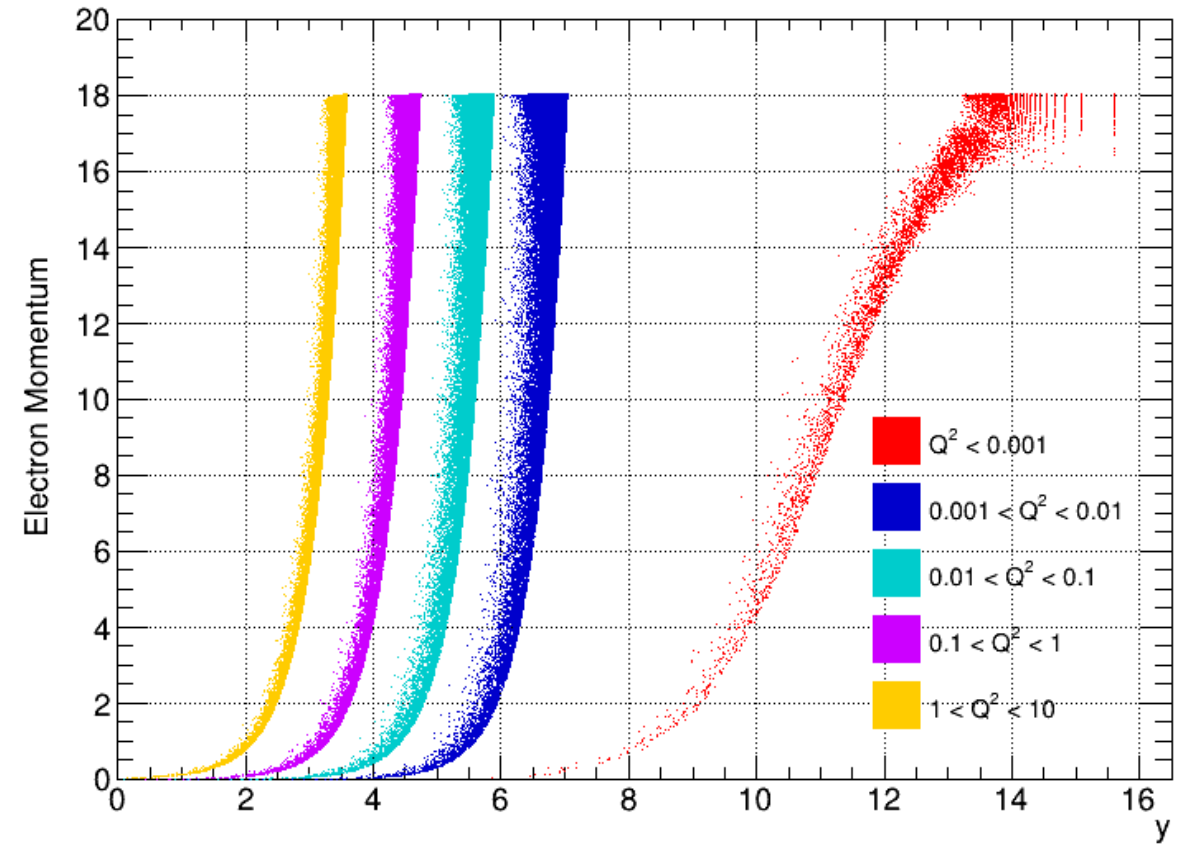
Forward/backward decay of the Kaons

$\phi \rightarrow K^+ K^-$ in eSTARlight Scattered Electron

18 GeV Electron
100 GeV Proton

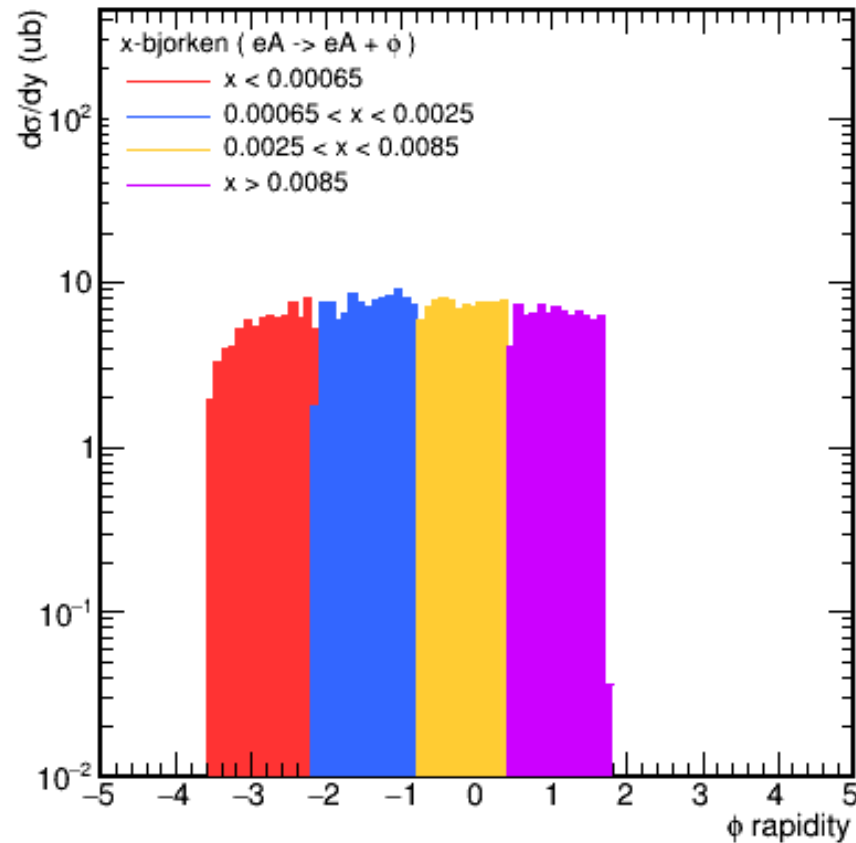


10,000 events at each Q^2

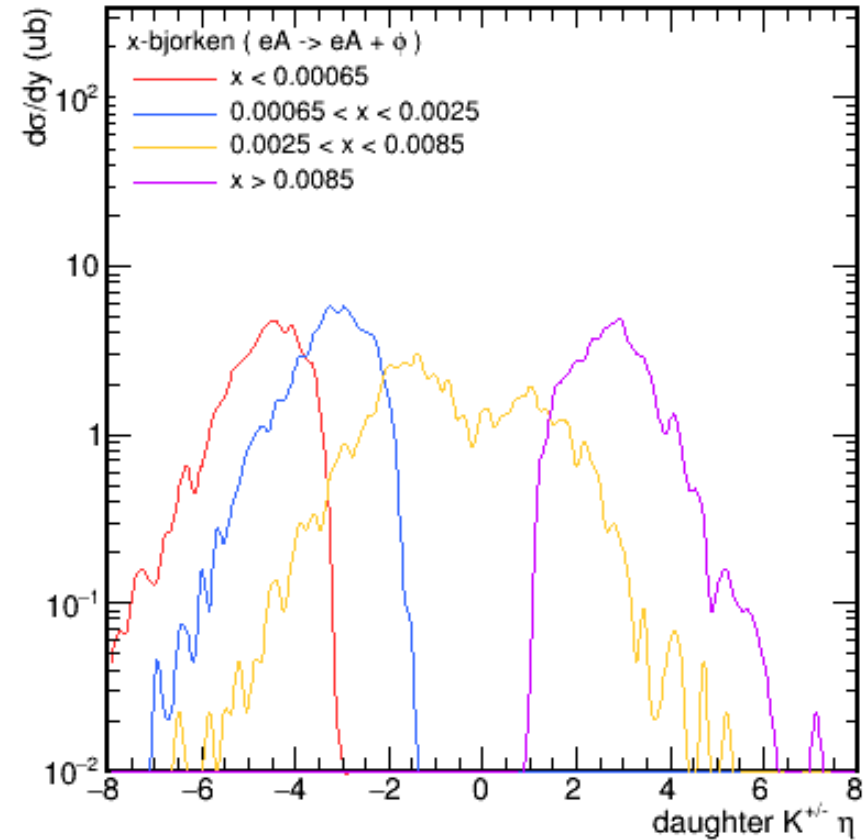


$\phi \rightarrow K^+ K^-$ in eSTARlight

18 GeV Electron
100 GeV Au



Electron (18 GeV) on Proton (100 GeV)
($0 < Q^2 < 100 \text{ GeV}^2$)

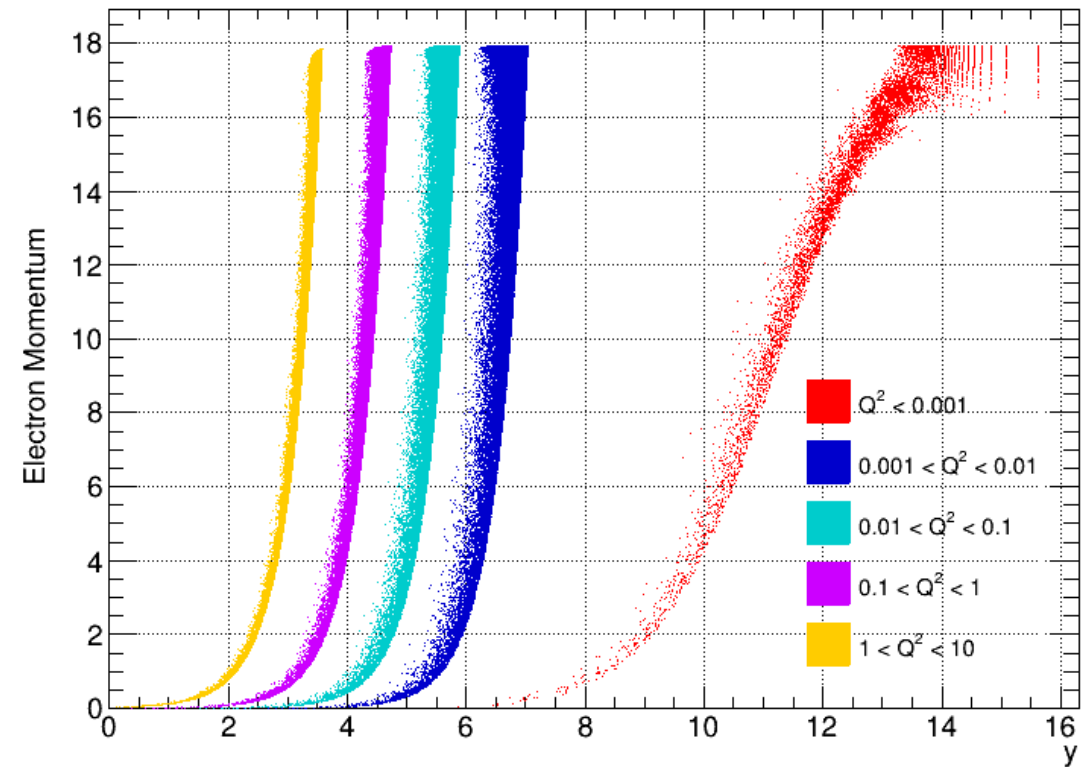
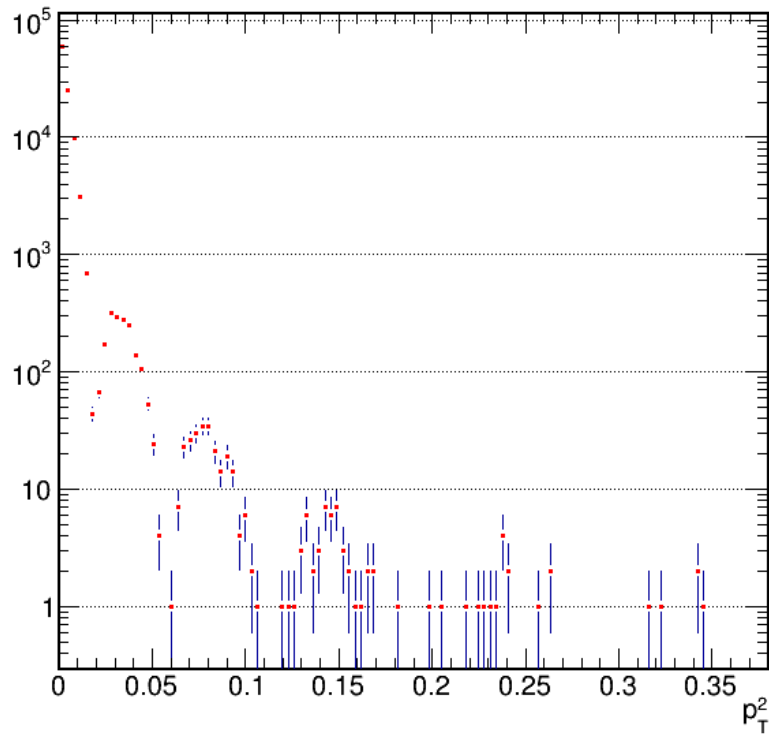


Forward/backward decay of the Kaons

$\phi \rightarrow K^+ K^-$ in eSTARlight
 Q^2 scan of scattered electron

18 GeV Electron
100 GeV Au

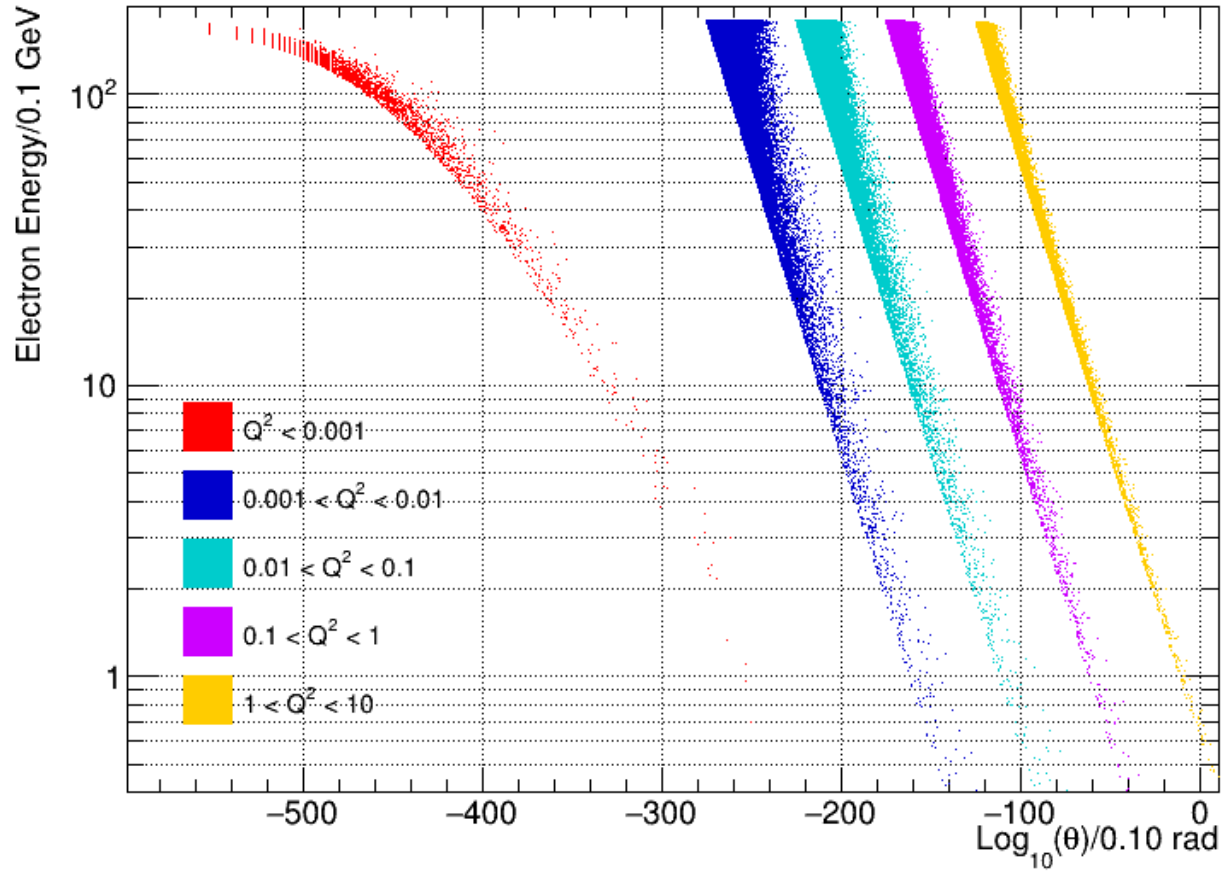
10,000 events at each Q^2



$\phi \rightarrow K^+ K^-$ in eSTARlight Q^2 scan of scattered electron

18 GeV Electron
100 GeV Au

10,000 events at each Q^2



Plots from Jaroslav Adam

Figure: Tagger 2

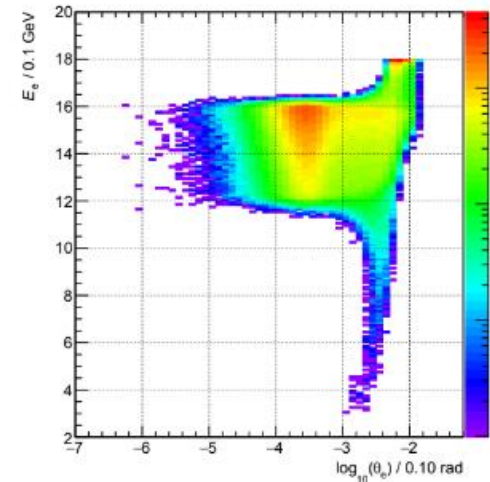


Figure: Tagger 1

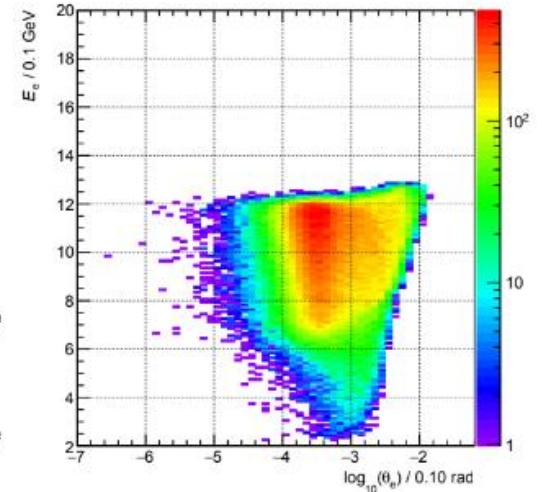
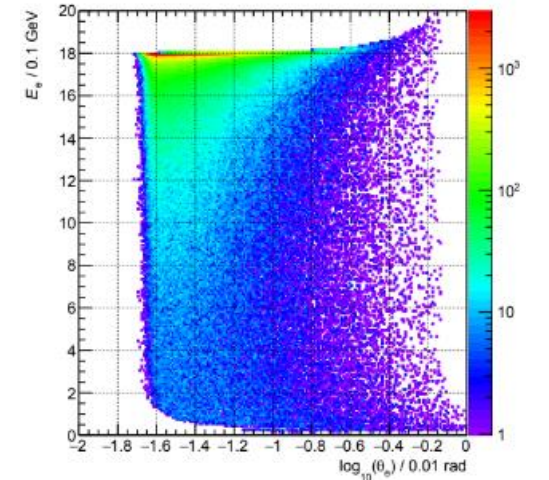


Figure: ECAL

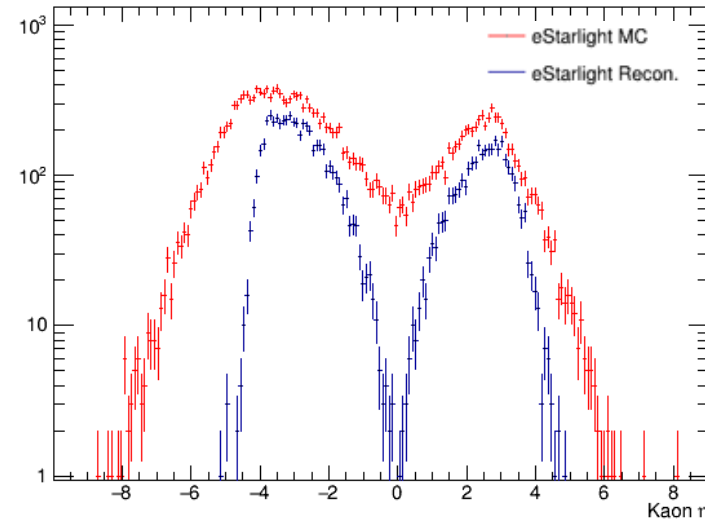
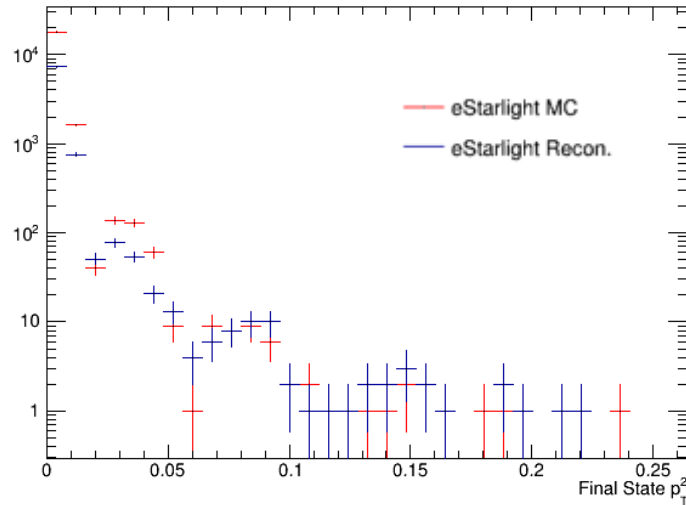
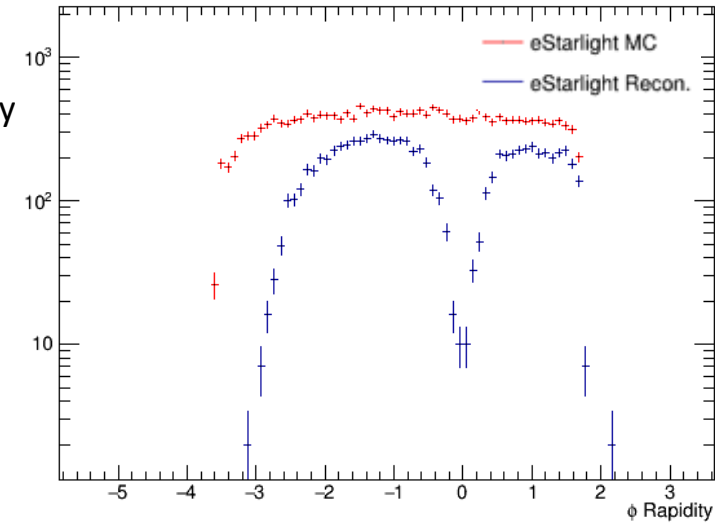
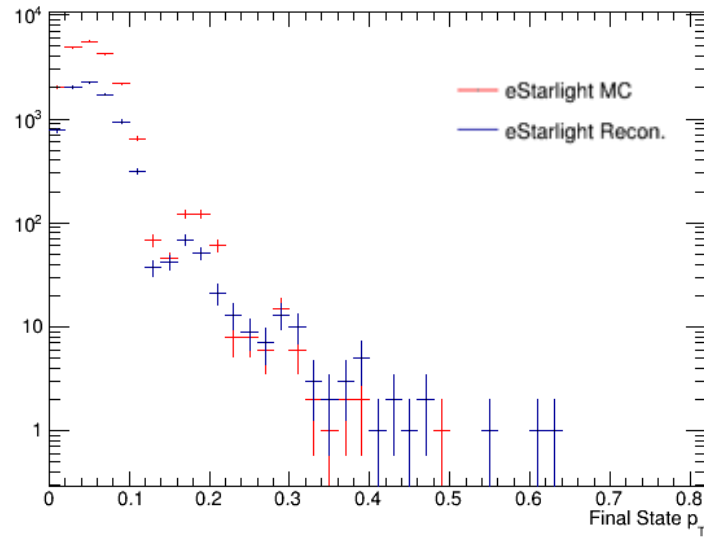


$\phi \rightarrow K^+ K^-$ in eSTARlight and EICRoot Kinematics Comparison

18 GeV Electron
100 GeV Au

eSTARlight + EICRoot All-Si Simulation

40% Efficiency



eSTARlight simulations for photoproduction & electroproduction

Kinematics of ep and eA $\phi \rightarrow K^+ K^-$

Systems studied:

Collider configurations:

Electron (18 GeV) on Au (100 GeV) for and

Electron (18 GeV) on protons(100 GeV)

Vector Mesons:

$\phi \rightarrow K^+ K^-$