Simulation Updates on PVDIS EC

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EC performance w/o background

- Cited from March collaboration Meeting

\[ \pi^- \text{ rejection} \]

\[ e^- \text{ efficiency} \]

Preshower ID power drop significantly at this bin
Second update of CLEO background

Reported Apr 30 Calorimeter Meeting
For each sector, background rate were calculated in high and low regions in phi

- Photon (EM) < dominant!
- Photon (\(\pi^0\))
- Electron
- Pion - Pion+

**High radiation azimuthal region**

**Low radiation azimuthal region**
Background distribution
New: with photon and pi+, Mid R, High Rad phi slice

- Photon (7 GHz/6+1 Hex cluster!)
- Electron
- Pion- Pion+
PID Performance (pion eff. w/ 94% elec. eff) w/o photon and pi+, Mid R, High Rad phi slice
PID Performance (pion eff. w/ 94% elec. eff) w/o photon, w/ pi+, Mid R, High Rad phi slice
PID Performance (pion eff. w/ 94% elec. eff) w/ photon, w/ pi+, Mid R, High Rad phi slice
Look elsewhere, Outer/Inner R PID Performance (pion eff. w/ 94% elec. eff)

w/ photon, w/ pi+, Outer R, High Rad phi slice

w/ photon, w/ pi+, Outer R, Low Rad phi slice

w/ o photon, w/ pi+, Inner R, High Rad phi slice

w/ o photon, w/ pi+, Inner R, Low Rad phi slice
First update of CLEO background

Reported Apr 23 Calorimeter Meeting
Zhiwen Updated background contribution for all configurations. PVDIS shown here:

- Photon
- Electron
- Pion - Pion+
Updated: Per-event pion rate for 1+6 hexagon cluster at inner radius

Background particle per trigger

- Electron
- Pion-
- Pion+

Lower pi- rate in new simulation
Updated: electron efficiency
Only electron and pi- background used

Not much change in electron eff.
Updated: pion rejection
Only electron and pi- background used

Preshower VS E/p

P-1.0 -0.8 -0.6 -0.4 -0.2 0.0 0.2 0.4 0.6 0.8 1.0 Preshower (GeV)

E/p

Preshower VS p

Preshower (GeV)
p (GeV/c)

P-1.0 -0.8 -0.6 -0.4 -0.2 0.0 0.2 0.4 0.6 0.8 1.0 Preshower (GeV)
p (GeV/c)

P-1.0 -0.8 -0.6 -0.4 -0.2 0.0 0.2 0.4 0.6 0.8 1.0 Efficiency

Momentum (GeV)

p>2GeV

x2 improved from last version
PVDIS trigger turn on curve
2GeV electron cut based on shower Hex1+6 cluster only
Layer #1 is 2cm preshower scint.
Layer #1 is 2cm preshower scint.

γ get reduced by ~5

π become important here
Last Version of Background Simulation (reported last week)
Why it is hard – lots of deep pions

- Photon
- Electron
- Pion - Pion+

Jin Huang <jinhuang@jlab.org>
Per-event pion rate for 1+6 hexagon cluster at inner radius

High pi+ rate?? Need to be checked
Electron efficiency w/ background at inner radius. Ignore gamma and pi+ bgd

Background pile ups
Pion efficiency w/ background at inner radius. Ignore gamma and pi+ bgd

Significant drop in rejection
What we can further try

- Position or kinematic dependent trigger threshold and cut threshold
- Use track multiplicity to assist calorimeter cuts