

Identifying $\gamma p \rightarrow \pi\pi K K p$

- Three Steps:
 - Find the proton
 - Find a Kaon
 - Identify the rest of the event
- Six Different Geometries:
 - No Cerenkov
 - Aerogel (n=1.01)
 - C4F10 (n=1.0015)
 - C4F10 at 1ATM (n=1.0030)
 - C4F10 at 2ATM (n=1.0045)
 - DIRC

Geometry Details

- BCAL TOF
 - 250ps resolution
 - 0.5% length resolution, 1% momentum resolution
- CDC dE/dx
 - 10% resolution (regardless of track length)
- FDC dE/dx (**new**)
 - 10% resolution (regardless of track length)
- Forward TOF
 - 70ps resolution
 - 0.5% length resolution, 1% momentum resolution

Geometry Details (cont.)

- Threshold CKOV options:
 - Pathlength $\sim 80\text{cm}$
 - $N_0 = 90\text{cm}^{-1}$
- DIRC option:
 - Angular resolution $\sim 2.1\text{mrad}$
 - Quartz ($n=1.45$)
 - (no material in GEANT)

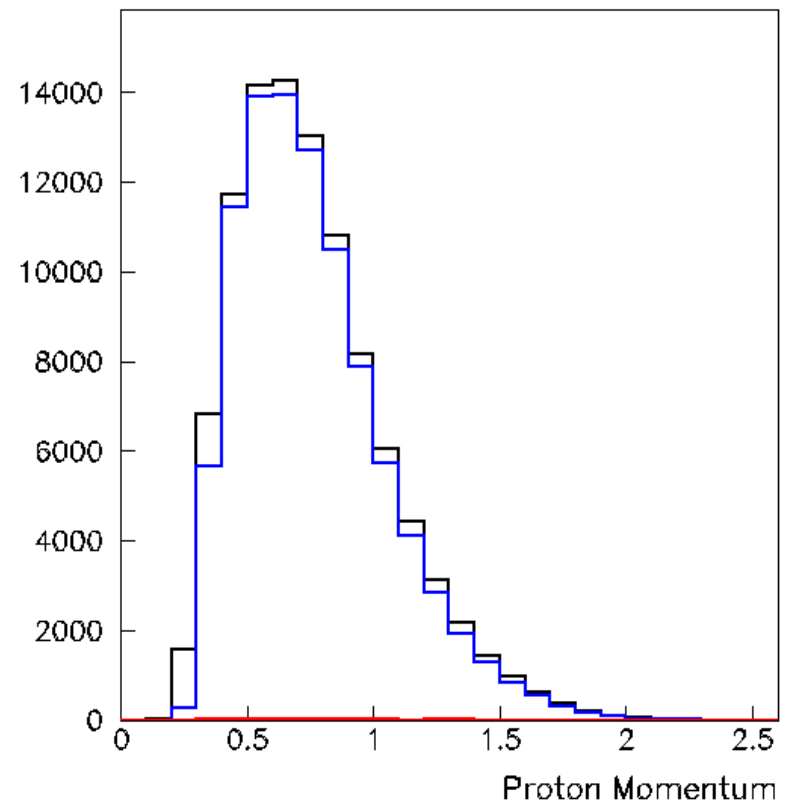
Algorithm Details (step I)

- Start with the final state $x-x-x+x+x+$.
- Step I. Pick out the proton among the $x+$.
 - Require $\chi^2_{\pi} > 6.63$ (reject π at 99% CL)
 - Require $\chi^2_K > 6.63$ (reject K at 99% CL)
 - Require $\chi^2_p < 6.63$

Starting Momentum

Correctly Identified Proton

Found Wrong $x+$



Algorithm Details (step II)

- Now we have $x-x-x+x+p$.
- Step II. Find a Kaon among the remaining x .
 - Find the most likely candidate.
 - Require $\chi^2_{\pi} > 6.63$ (reject π at 99% CL)
 - Require $\chi^2_K < 6.63$
- Now we have $x-K-x+x+p$ or $x-x-x+K+p$.

Algorithm Details (step III)

- Suppose we have $x-x-x+K+p$.
- There are only three combinations left for the remaining x 's (ignoring K_{short} and Λ):
 - $K-pi-pi+$
 - $pi-K-pi+$
 - $K-K-K+$
- Step III. Find the most likely of these by rejecting the other two at 99%CL.

Efficiencies for Different Options

