Cascade Simulations Update
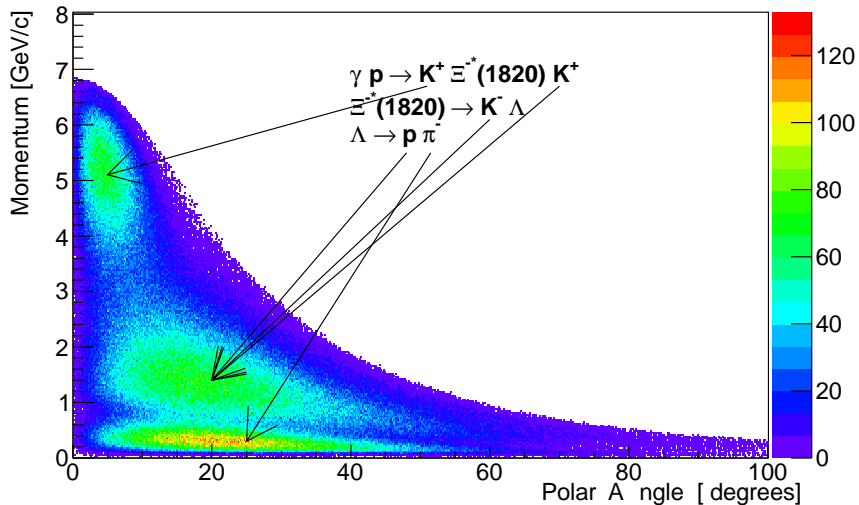
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GlueX Physics Meeting
08/13/2012

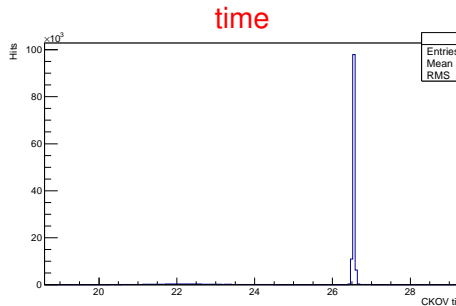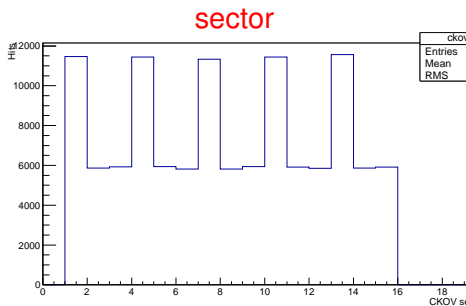# Generated Momentum versus θ Distributions

Characteristics

Gas Threshold Counter (RPI design)

- starts at downstream edge of solenoid
- C_4F_{10} gas (n=1.00153), $\approx$ 2 m in length
- $p_{th} \approx$ 2.5 GeV/c for pions, 8.9 GeV/c for kaons
- 15 sectors in ϕ, each with PMT (z$\approx$590 cm,R$\approx$100 cm)
- Cherenkov light focussed onto PMTs by mirror system
- 1.5-5.0 eV radiation window
- Optics optimized by Eugene Chudakov and implemented in HDGeant by Richard Jones

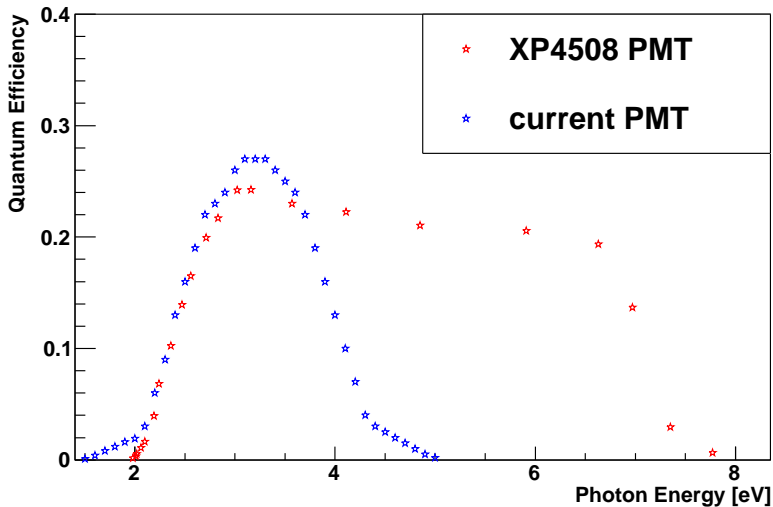How much does a Cherenkov detector improve PID of fast forward-going kaons?

Single Particle Test

- Threw 200k π^+ tracks with 2 GeV/c < p < 7 GeV/c, $0° < \theta < 14°$
- Looked at acceptance, detection efficiency, and photoelectron distributions

sector

time

Characteristics

CKOV PMT QE curves
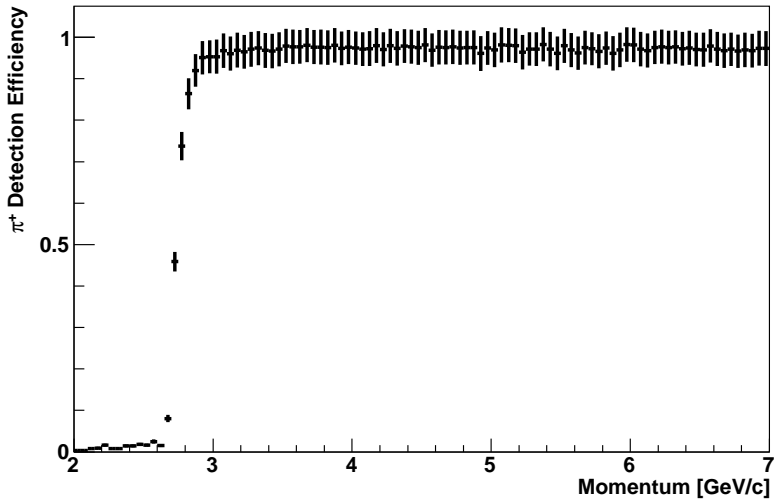
Characteristics
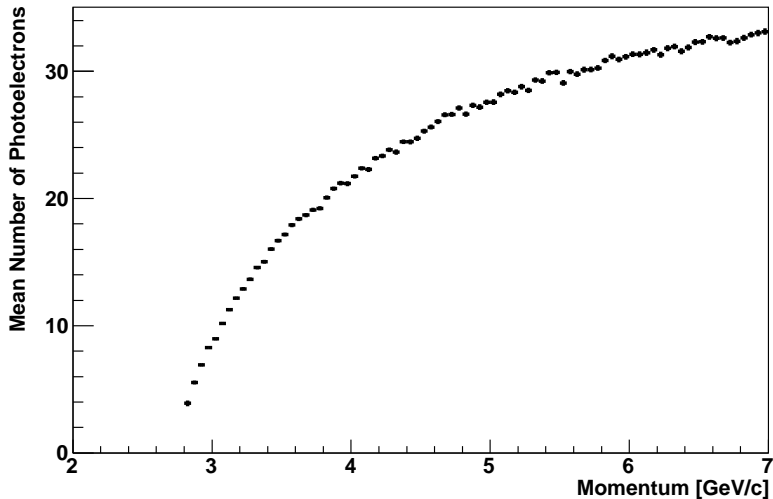
CKOV Detection Efficiency

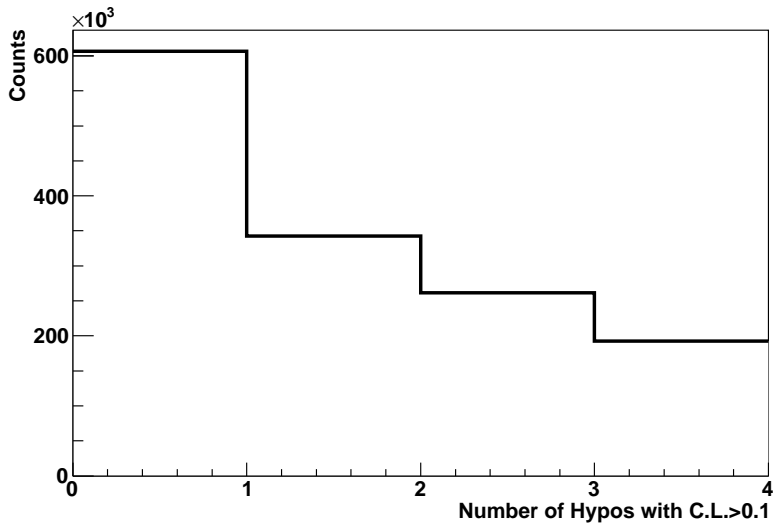# CKOV Photoelectrons versus Momentum

Efficiency study

- Threw 1M K^+ tracks with 2 GeV/c < p < 8 GeV/c, $0° < \theta < 20°$
- Threw 1M K^+ tracks with 0 GeV/c < p < 2 GeV/c, $0° < \theta < 60°$
- Looked at number of hypotheses with pid χ^2 probability larger than 10 %

Counts

Efficiency Study

Distribution