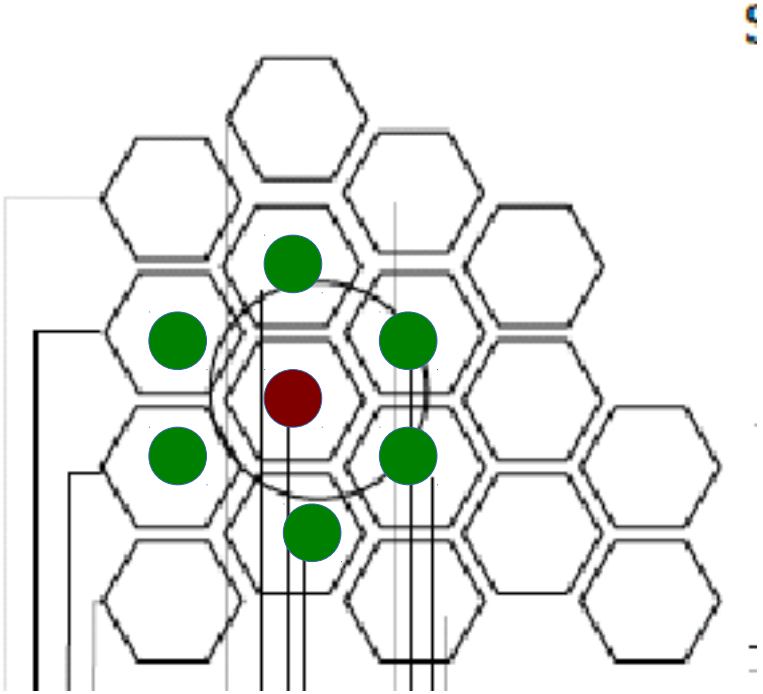
Simulation Summary

- Using remoll simulation
- Baffles : Lead babar_more1
- Wiser DIS and pions inputs
- Full EM calorimeter included

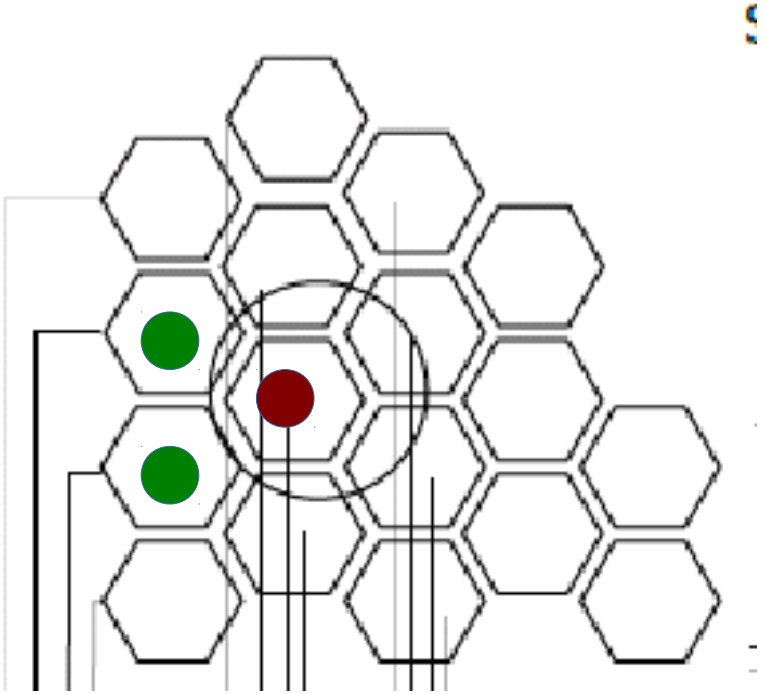
Analysis Summary

- For DIS e , pions (±) simulations
  - Summed photons produced by the ecal block scintillators for two trigger algorithms
    - 6+1 sum and 2+1 sum
- Computed trigger rates for two schemes using full ECAL

ECAL Summing Schemes

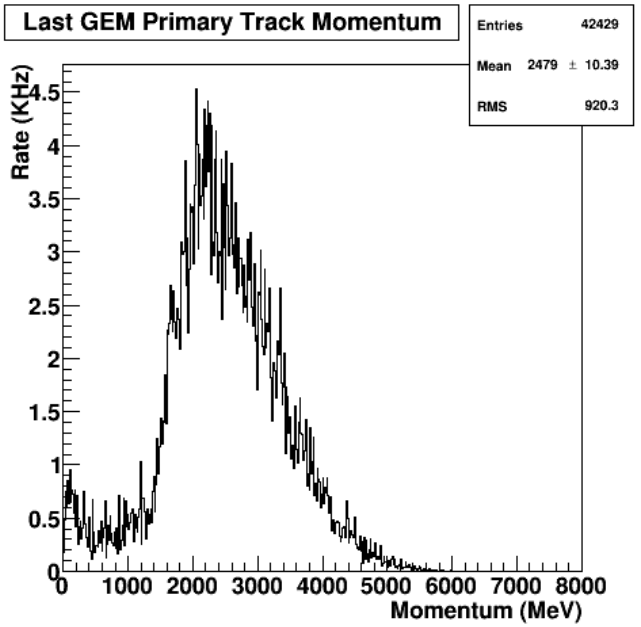


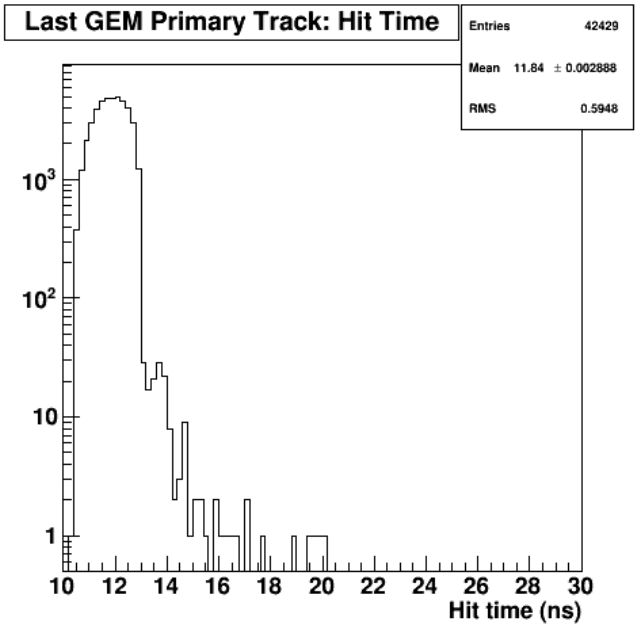
6 + **1** Summing Scheme

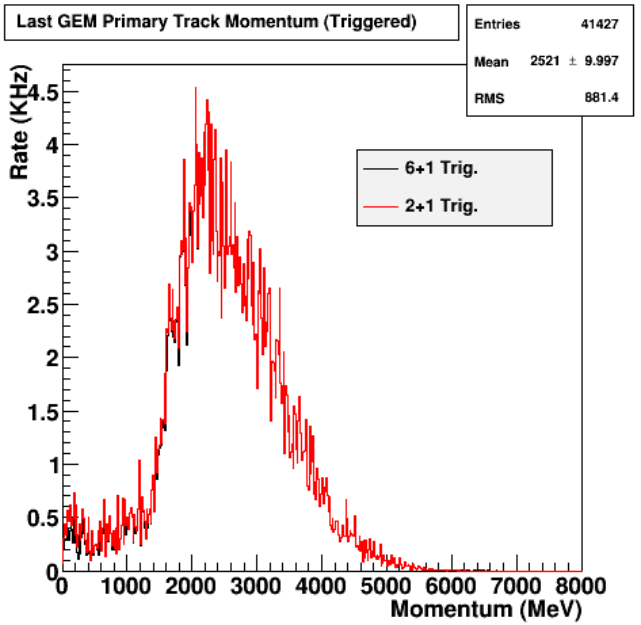


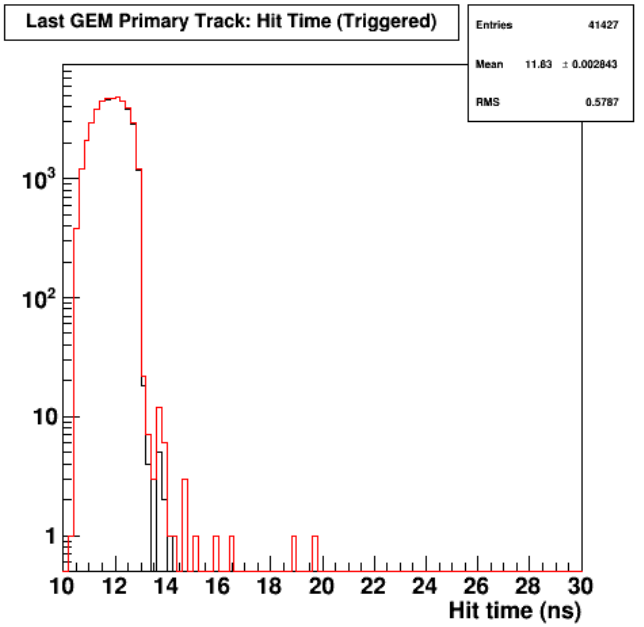
2 + **1** Summing Scheme

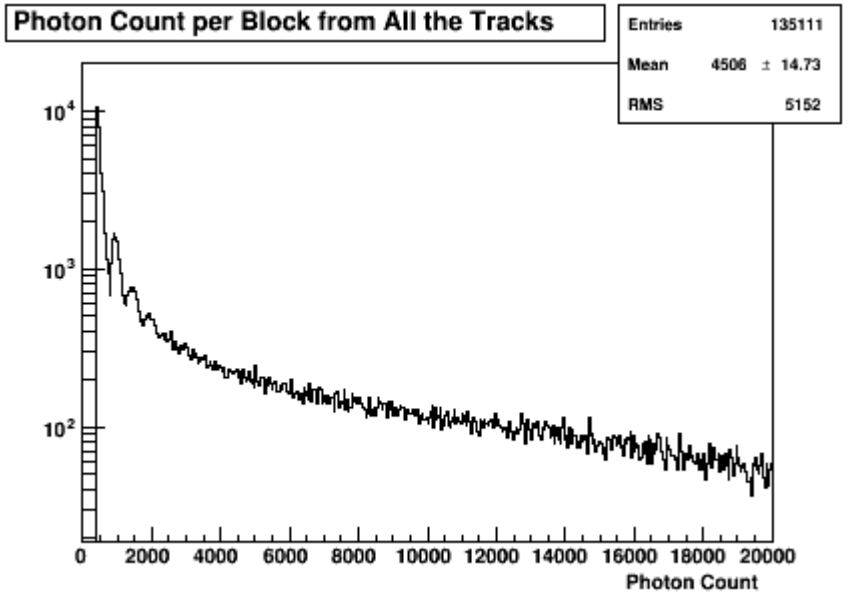
Rates and Timing at the GEM

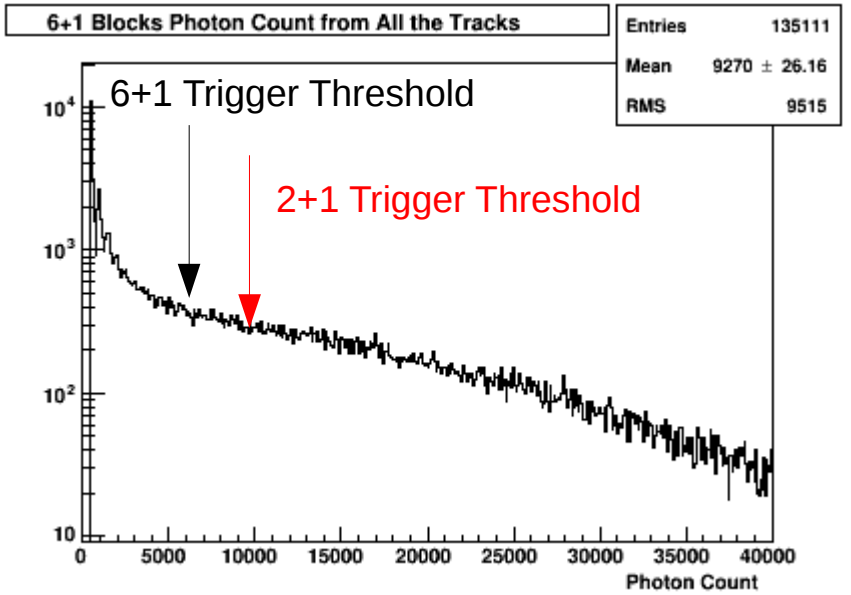


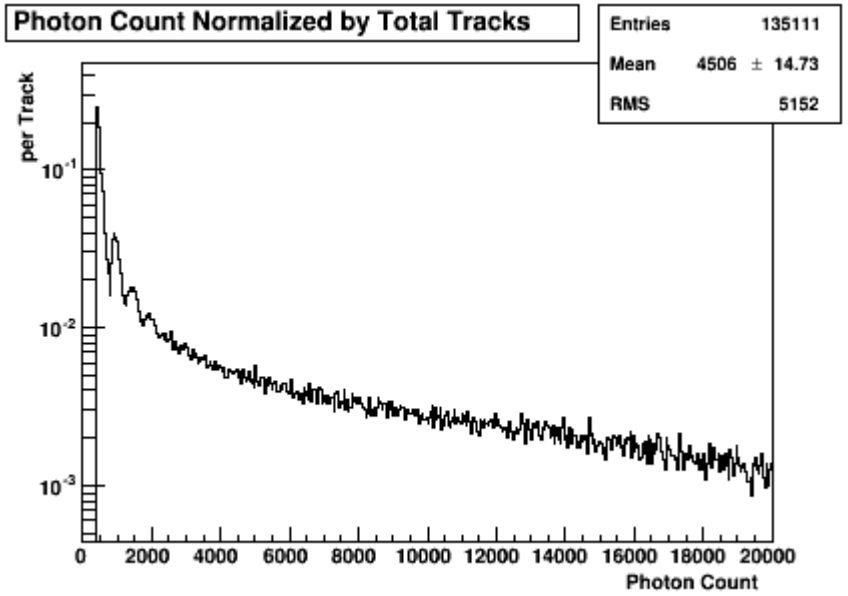


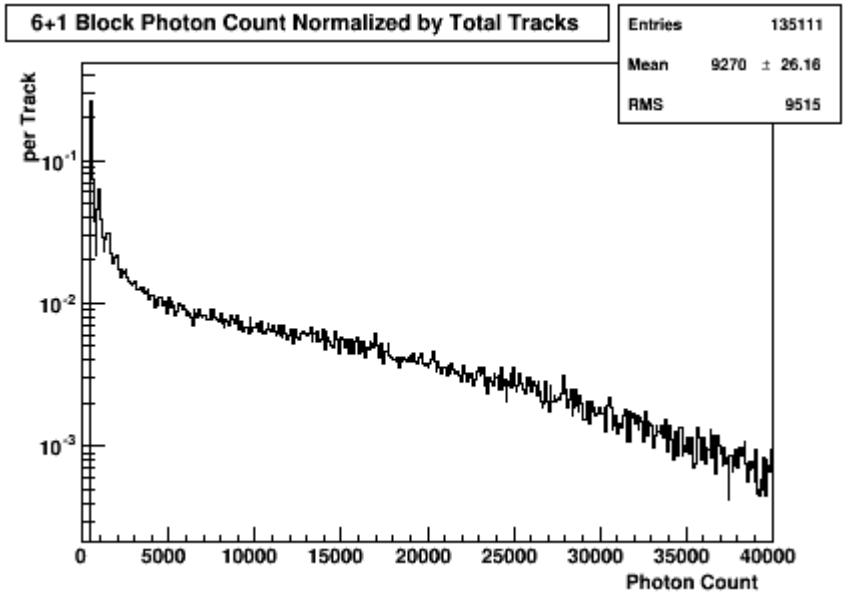




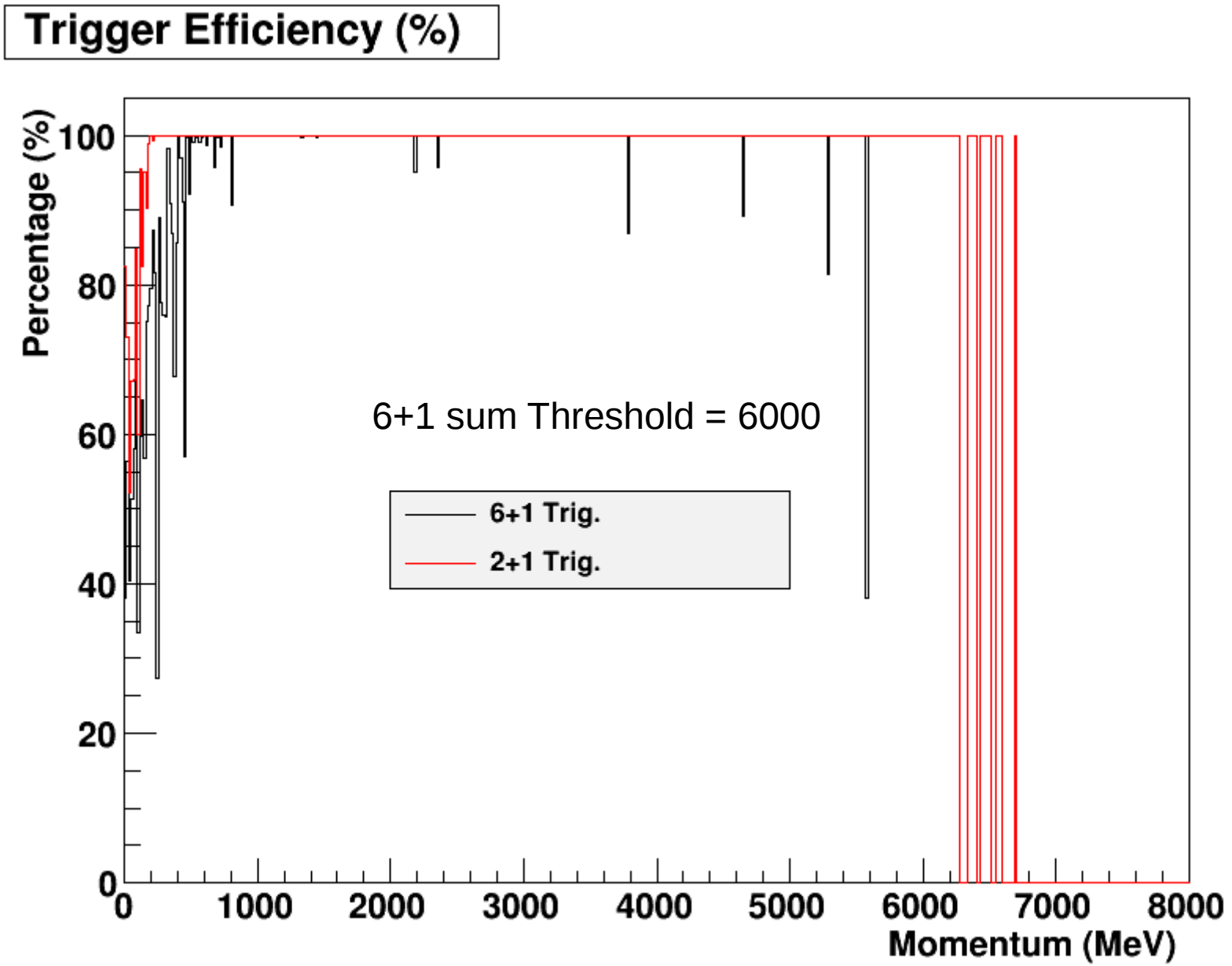

Photon Count per Block from All the Tracks
Entries 135111
Mean 4506 ± 14.73
RMS 5152
Photon Count


6+1 Blocks Photon Count from All the Tracks
Entries 135111
Mean 9270 ± 26.16
RMS 9515
6+1 Trigger Threshold
2+1 Trigger Threshold
Photon Count


Photon Count Normalized by Total Tracks
Entries 135111
Mean 4506 ± 14.73
RMS 5152
per Track
Photon Count

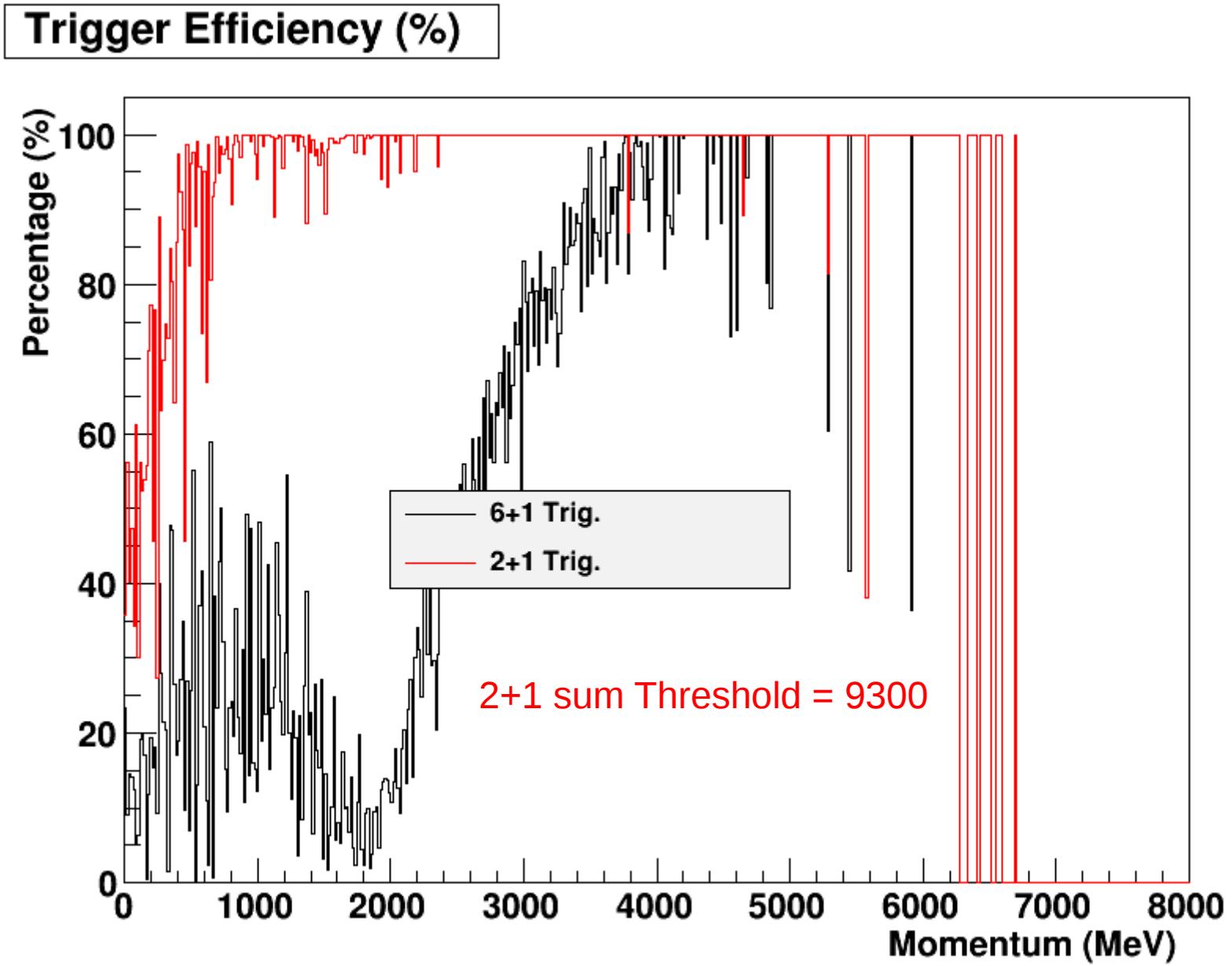

6+1 Block Photon Count Normalized by Total Tracks
Entries 135111
Mean 9270 ± 26.16
RMS 9515
per Track
Photon Count

DIS Electrons : 6 + 1 Sum



- Total DIS Rate = 442.9 kHz
- DIS Trigger Rate = 437.5 kHz (6+1 sum)

DIS Electrons : 2 + 1 Sum



- Total DIS Rate = 442.897 kHz
- DIS Trigger Rate = 434.161 kHz (2+1 sum)

Rate Summary

Primary Pions Only

	Total Rate	6 + 1 Trigger Rate	2 + 1 Trigger Rate
e- (DIS)	442.9 kHz	437.5 kHz	434.2 kHz
π-	473.6 MHz	93.5 MHz	32.5 MHz
π+	263.4 MHz	14.6 MHz	1.1 MHz

Primary and Secondary Pions

	Total Rate	6 + 1 Trigger Rate	2 + 1 Trigger Rate
e- (DIS)	442.9 kHz	437.5 kHz	434.2 kHz
π-	947.2 MHz	186.9 MHz	64.9 MHz
π+	526.8 MHz	29.2 MHz	2.2 MHz

Current Issues to Resolve

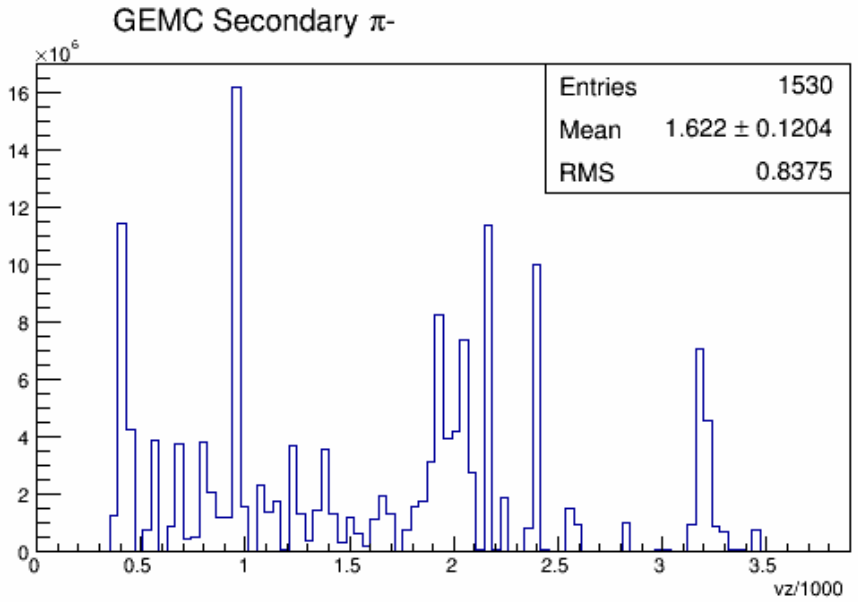
Secondary Pion Rates Remoll vs. GEMC

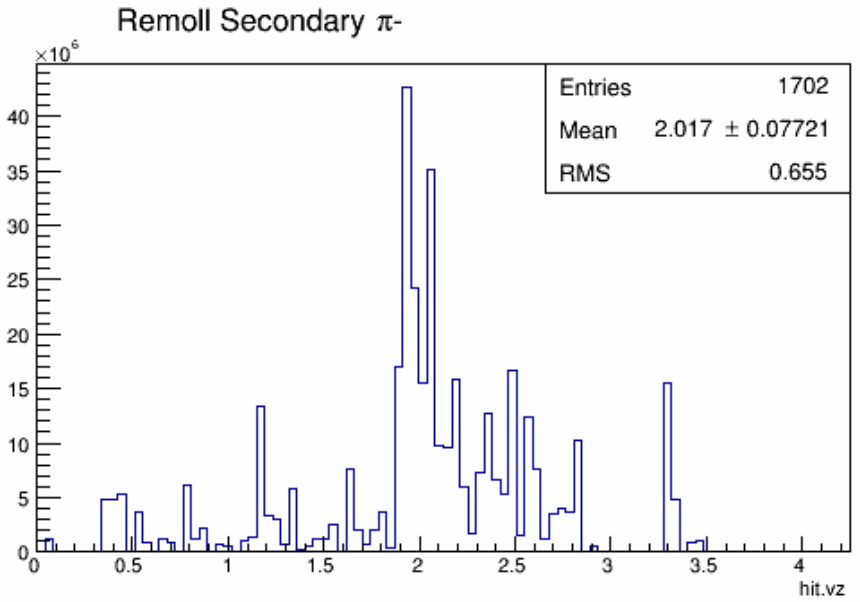
Sec. π- Rate	Up-to Baffles (MHz)	After Baffles (MHz)	Total (MHz)
GEMC	84.7	70.2	154.9
Remoll	87.9	290.7	378.6

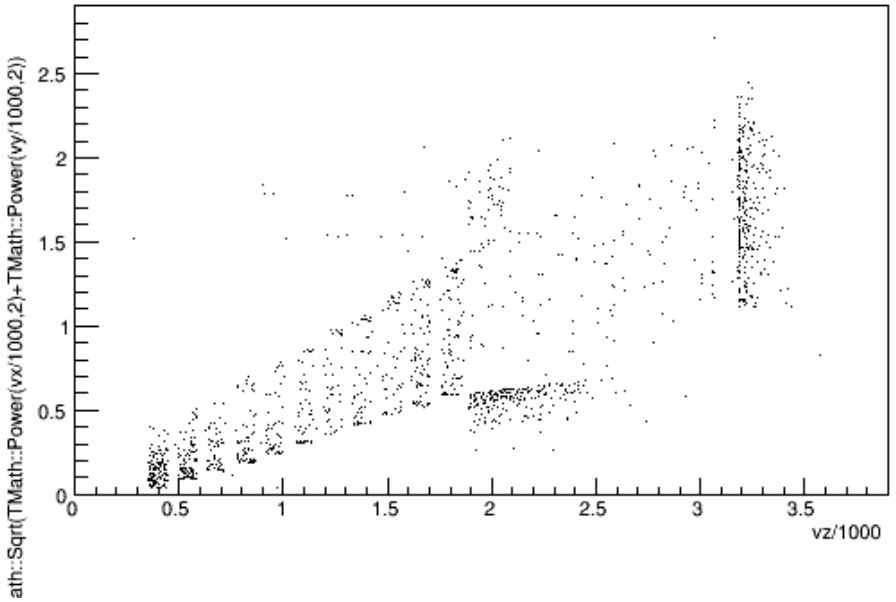
Sec. π+ Rate	Up-to Baffles (MHz)	After Baffles (MHz)	Total (MHz)
GEMC	52.1	34.2	86.3
Remoll	56.1	166.3	222.4

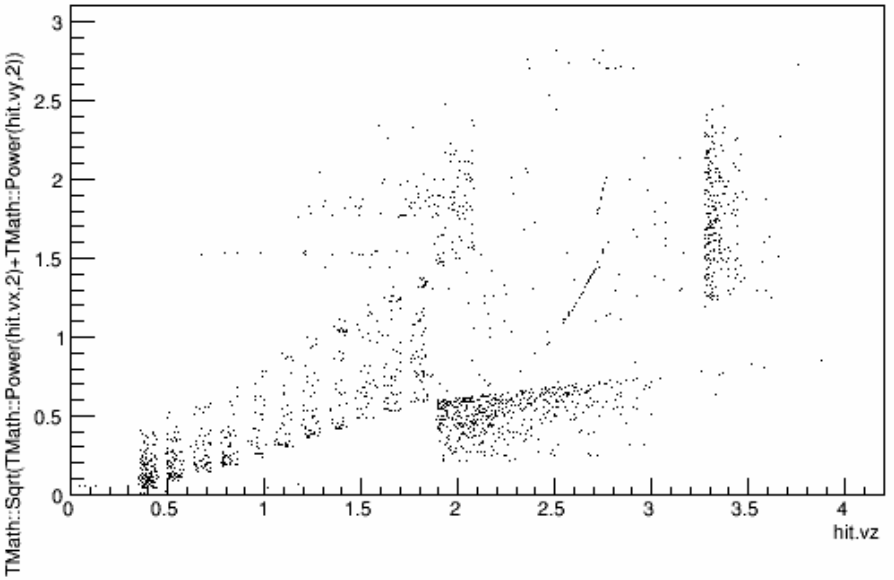
Looking at how cerenkov and ecal implemented in GEMC and Remoll to understand this.

Secondary Pion Rates Remoll vs. GEMC

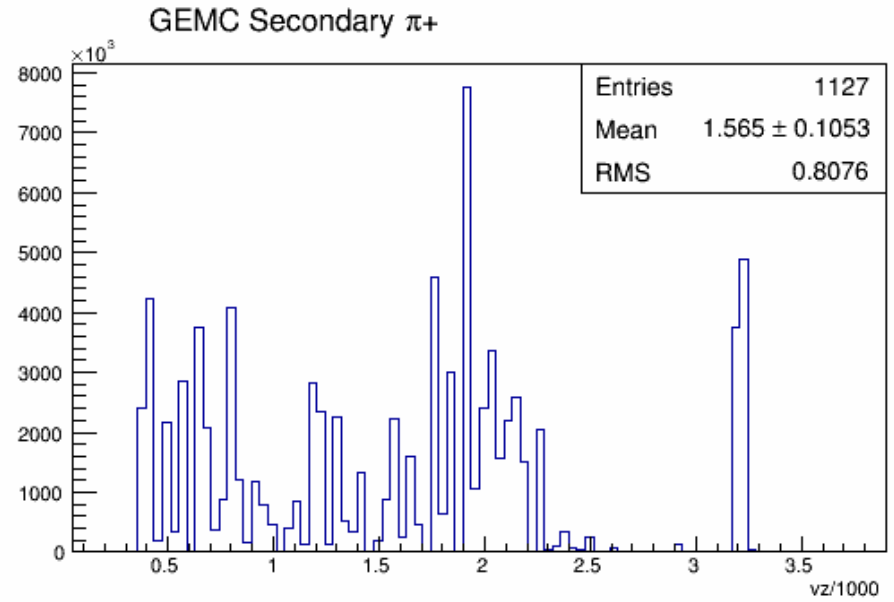


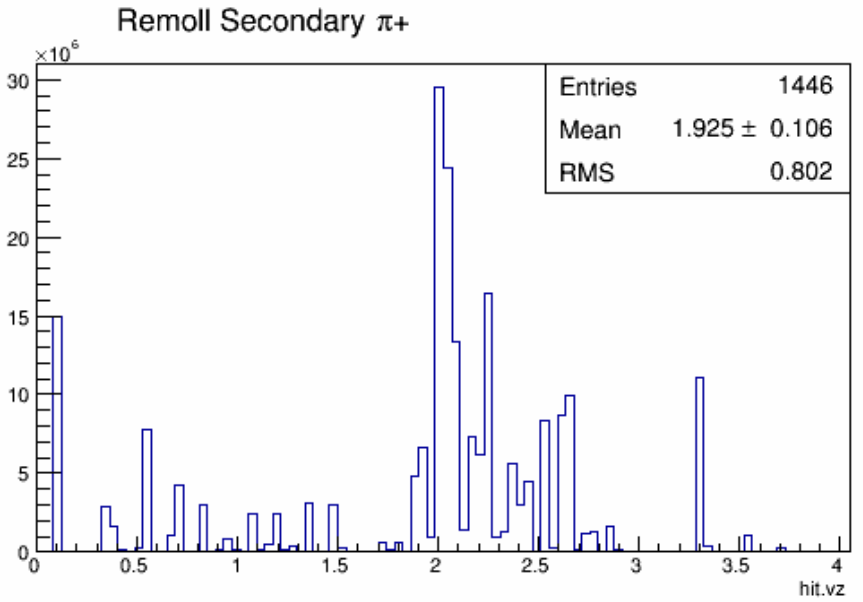


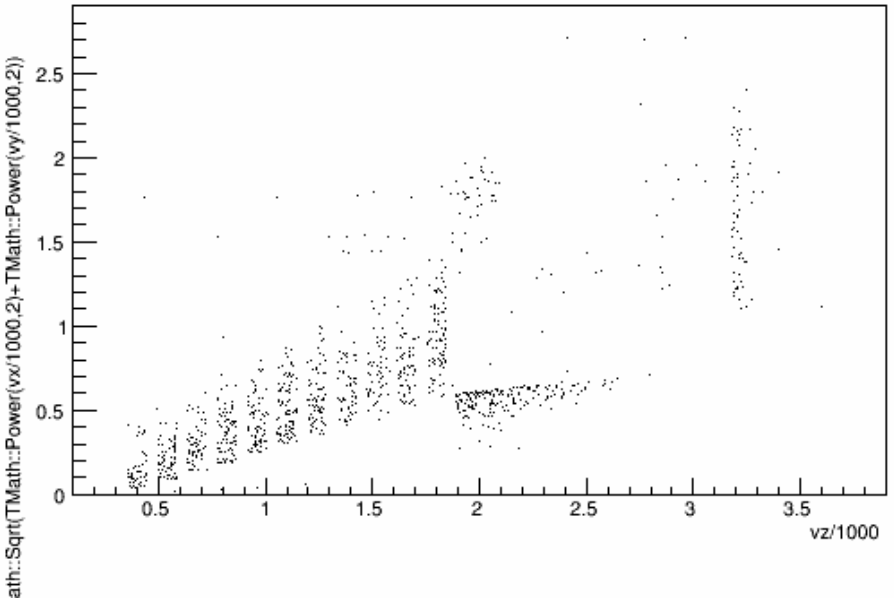


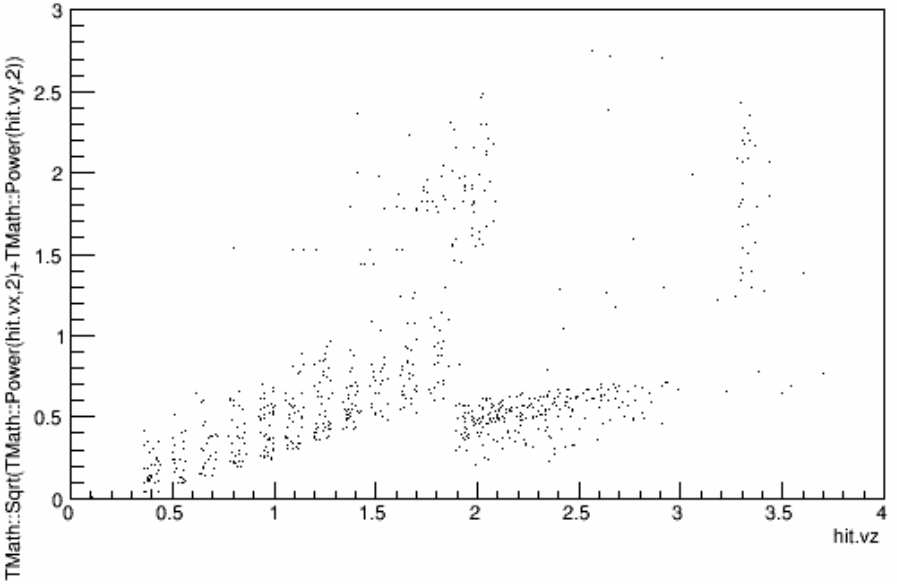


Secondary Pion Rates Remoll vs. GEMC

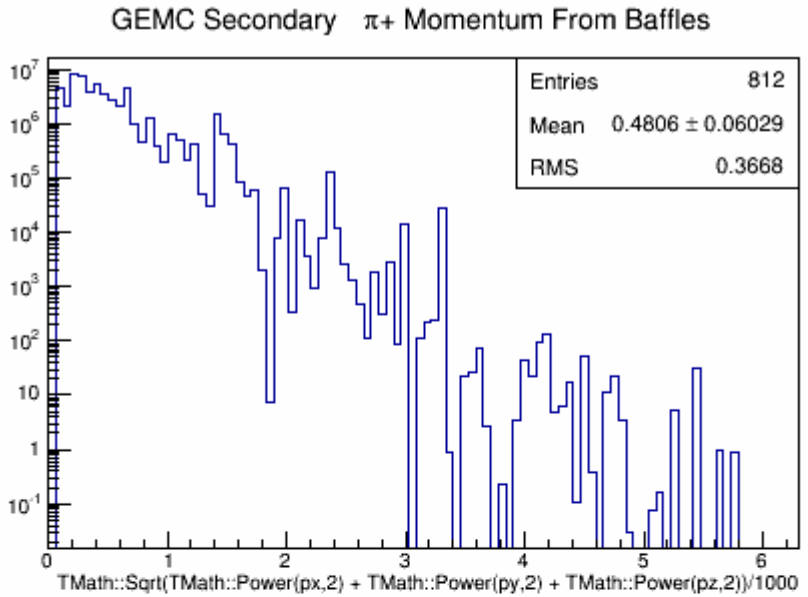


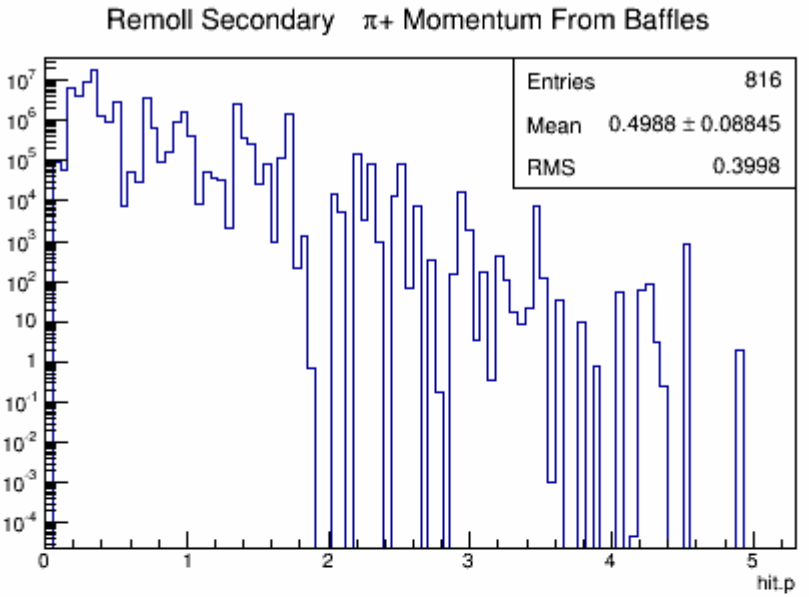


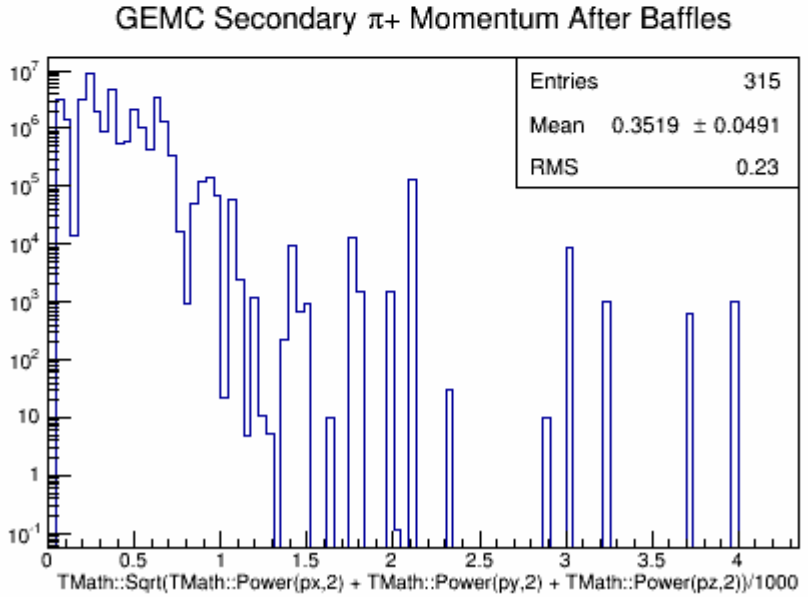


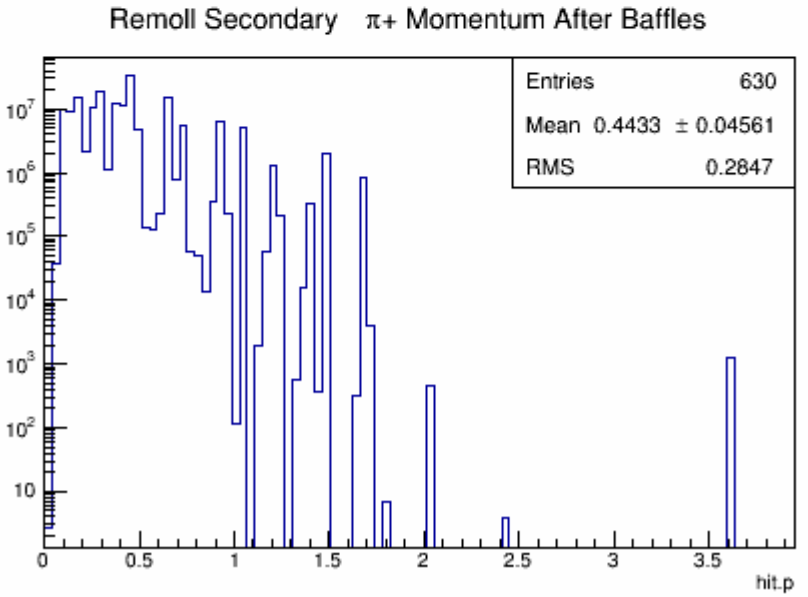


Secondary Pion Rates Remoll vs. GEMC

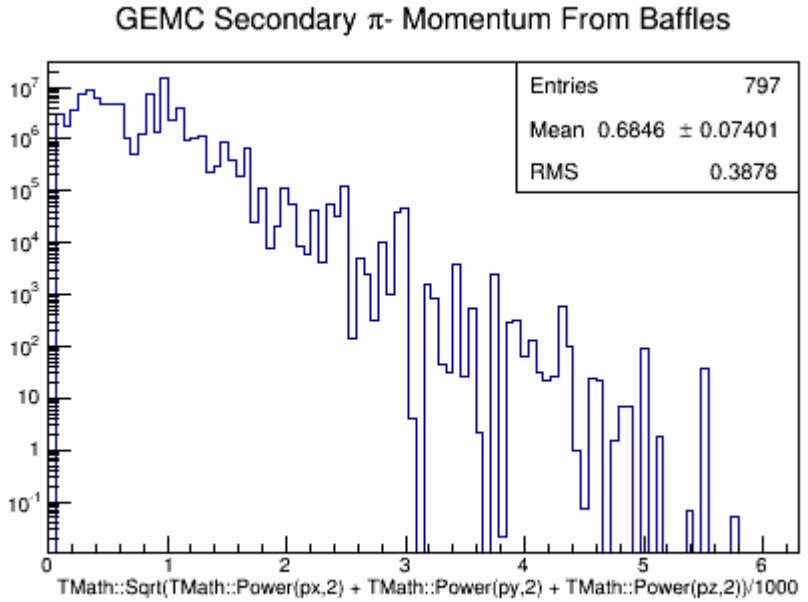


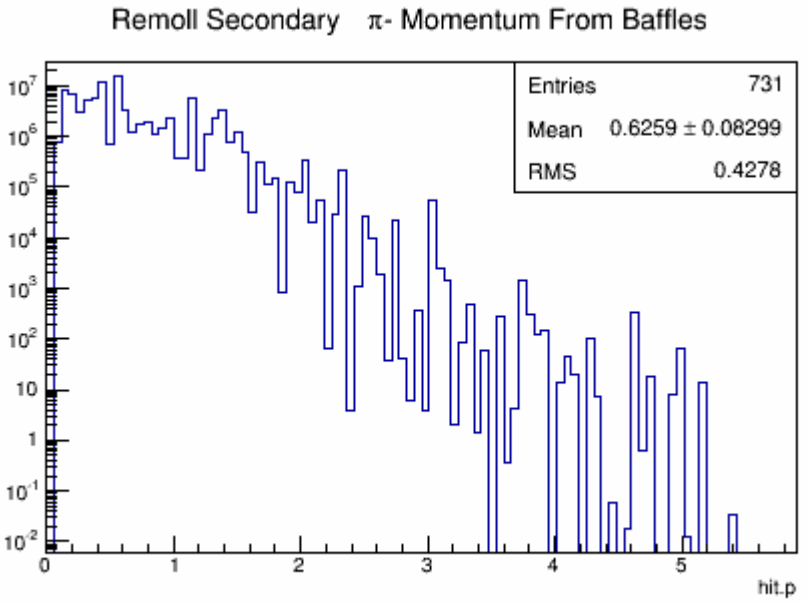


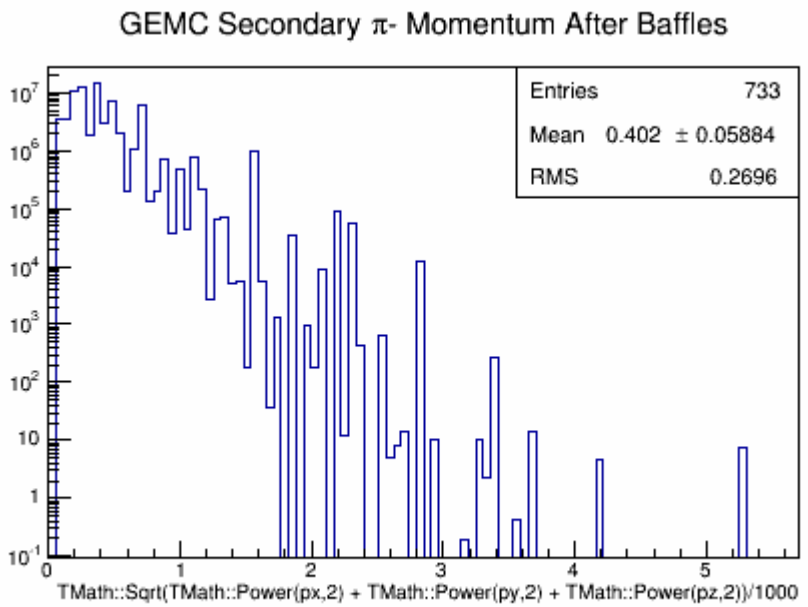


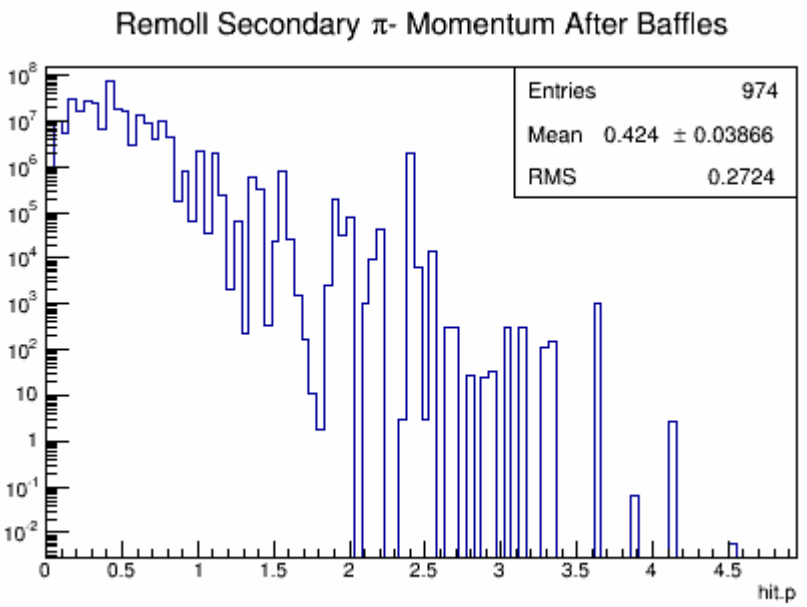


Secondary Pion Rates Remoll vs. GEMC





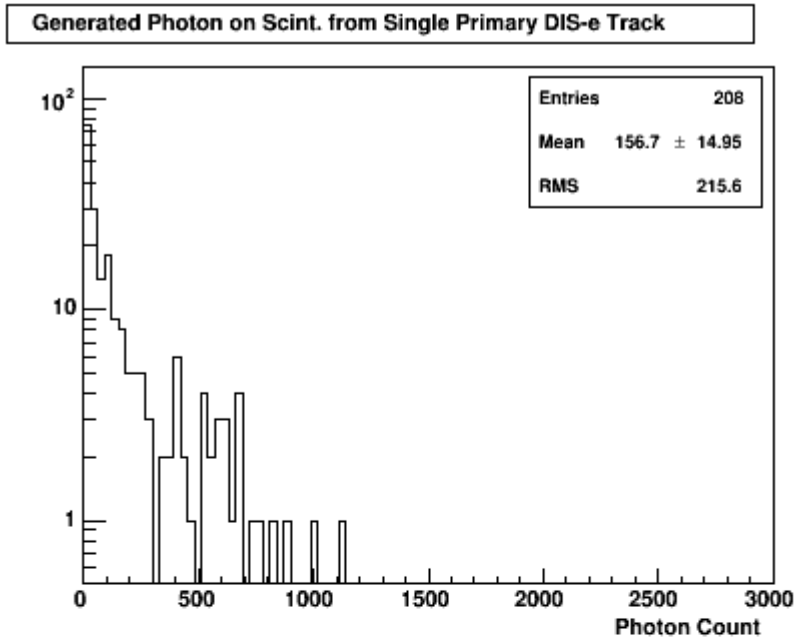


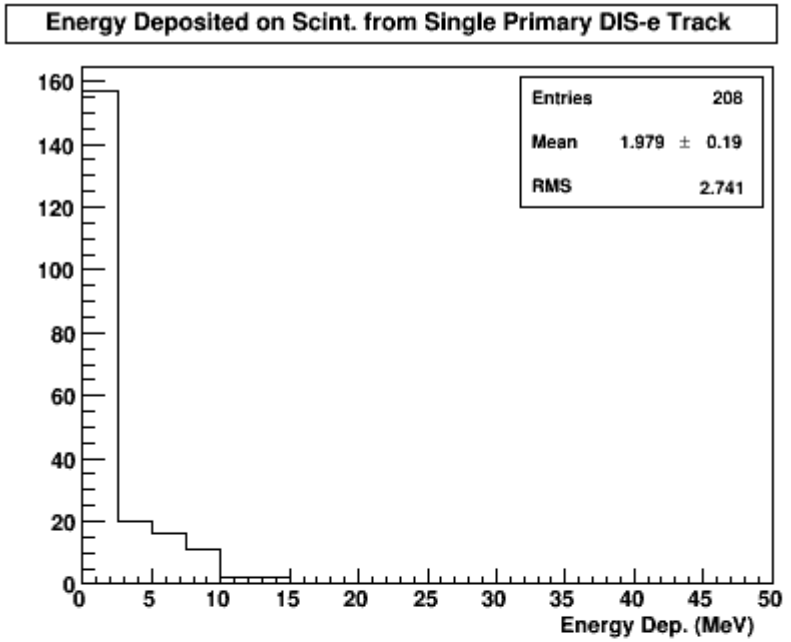


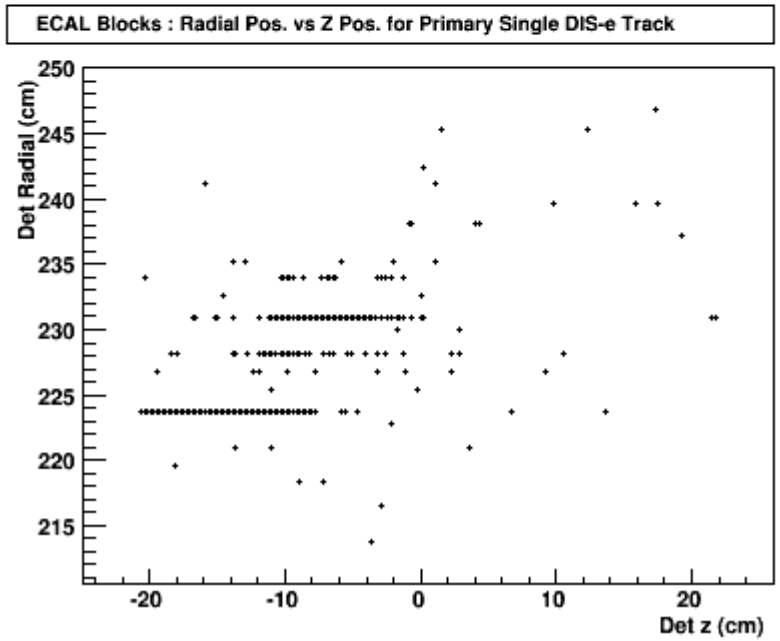
Rest of the Plots

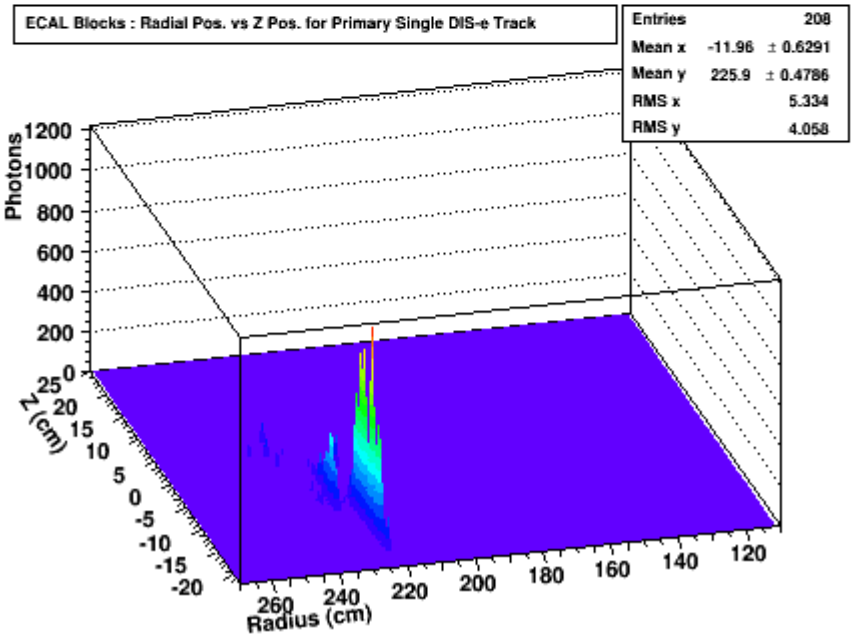
DIS-e Single Event

Energy deposition for a single event with Pb baffles



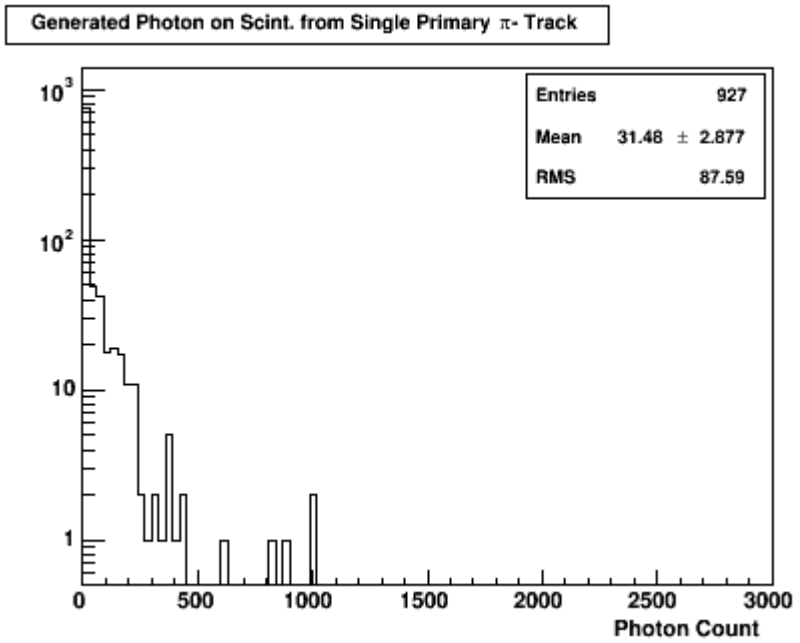


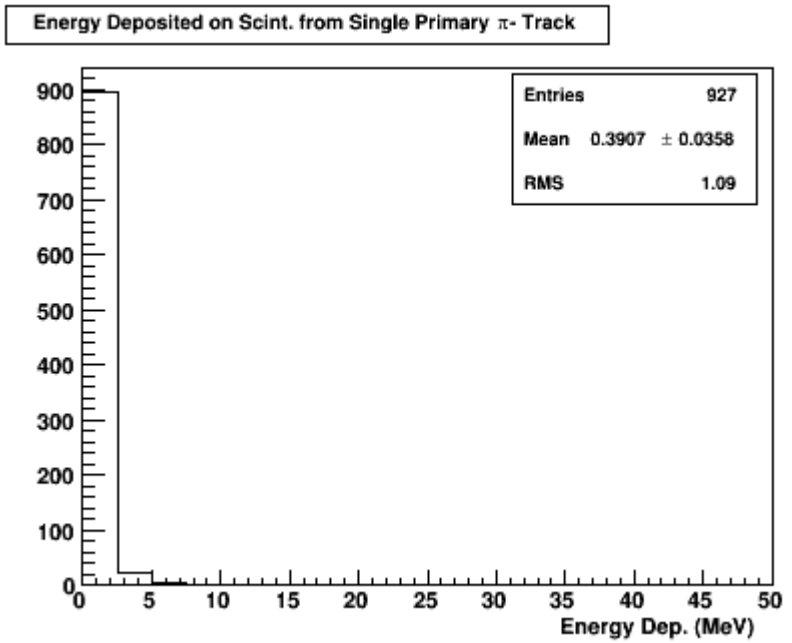


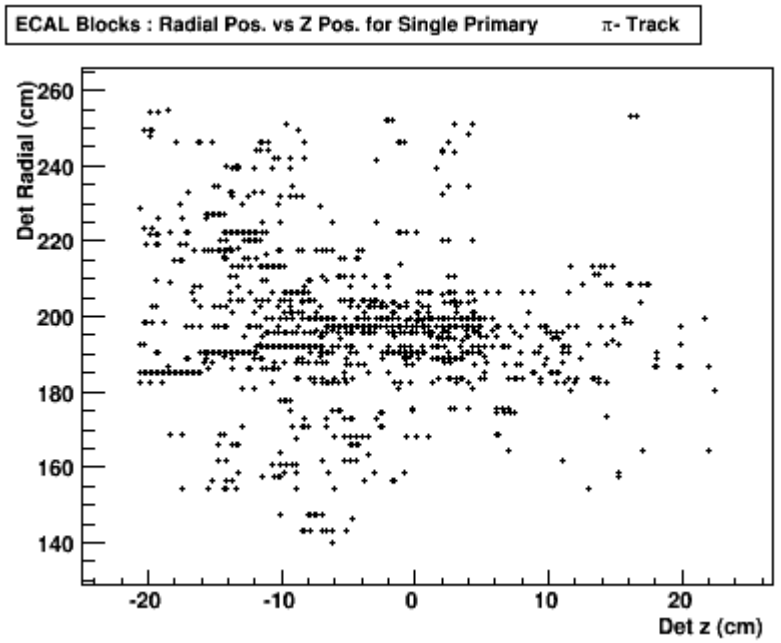


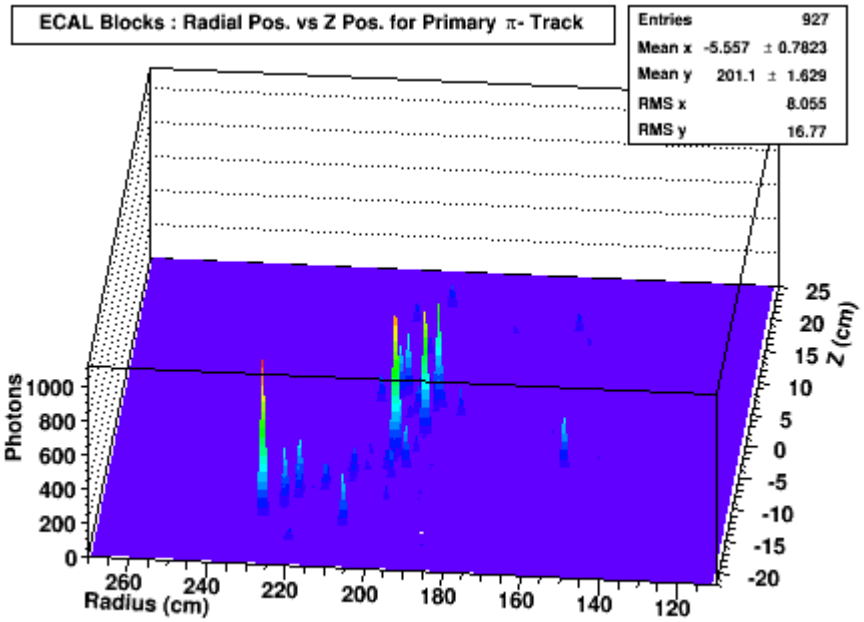
π- Single Event

Energy deposition for a single event with Pb baffles



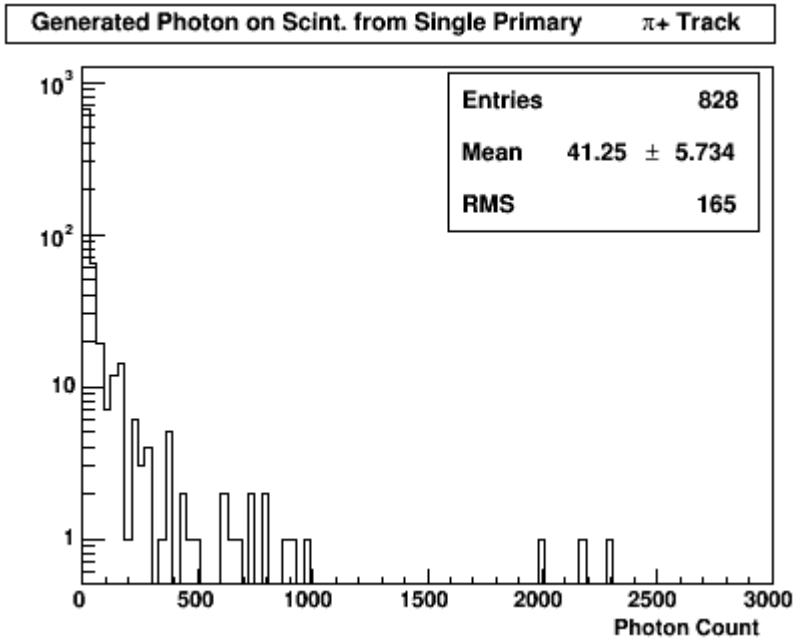


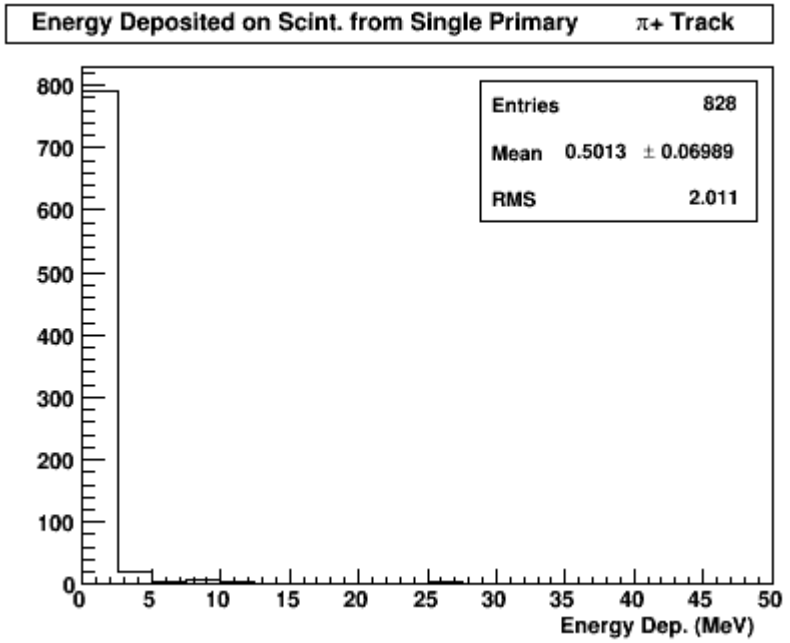


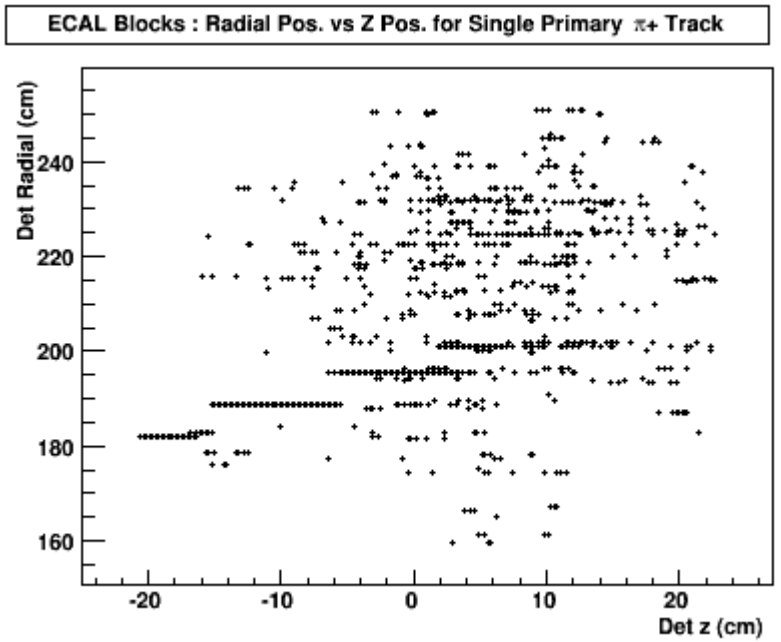


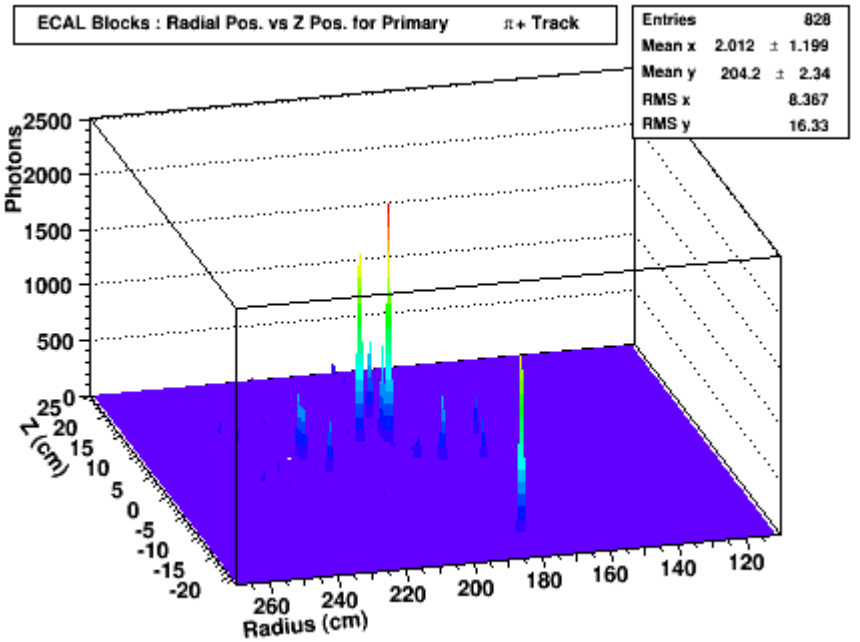
π+ Single Event

Energy deposition for a single event with Pb baffles

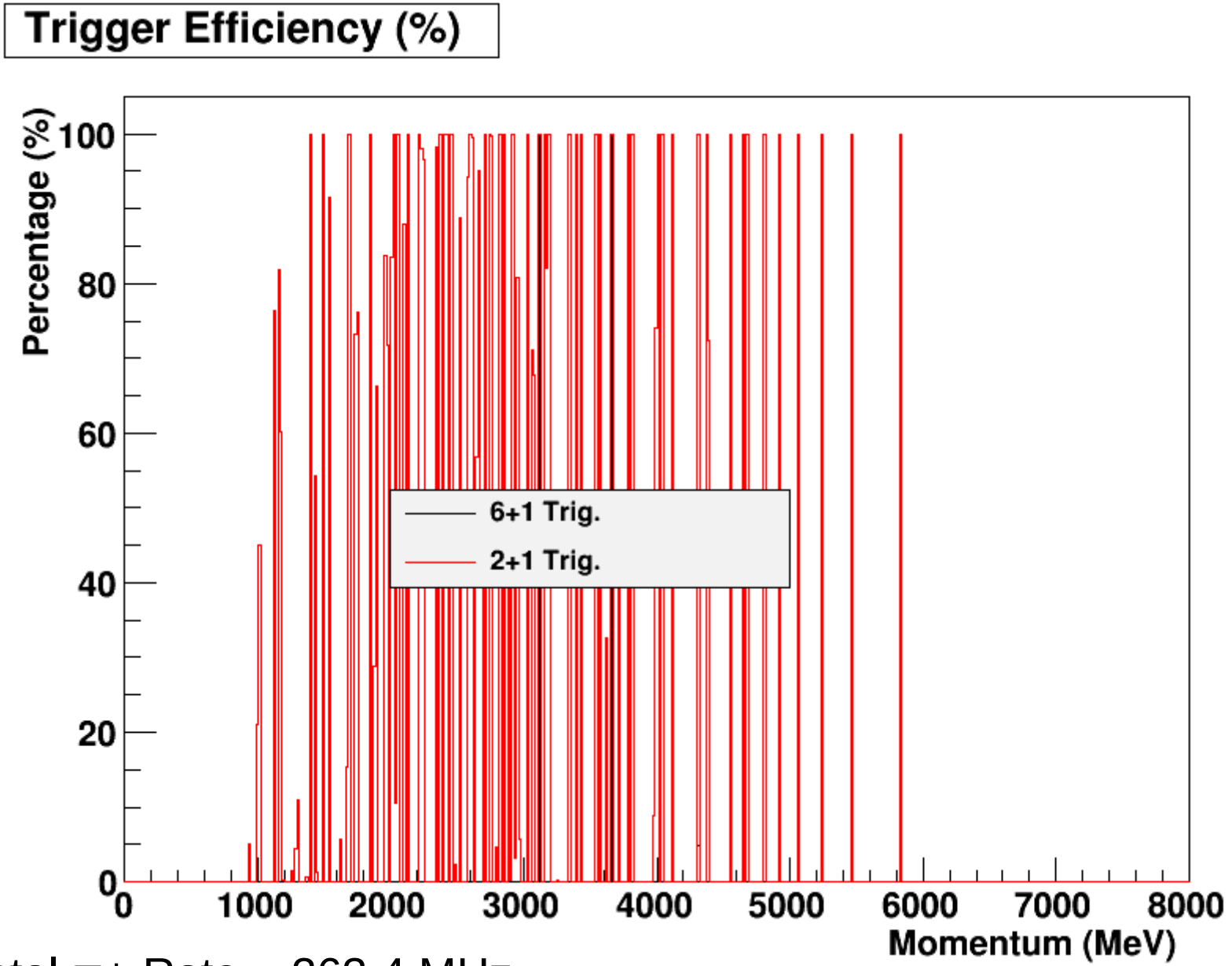






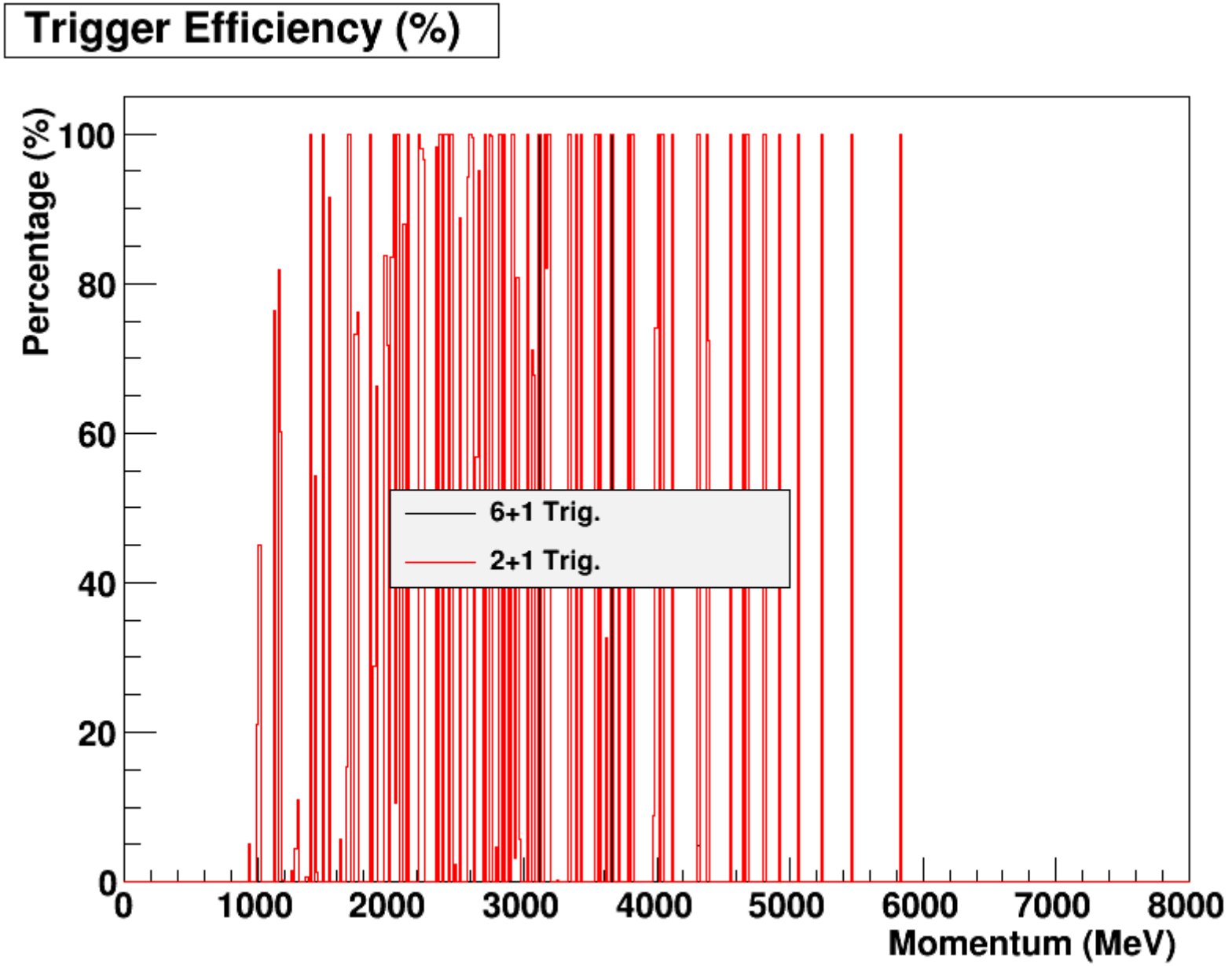


Primary π+ : 6 + 1 Sum



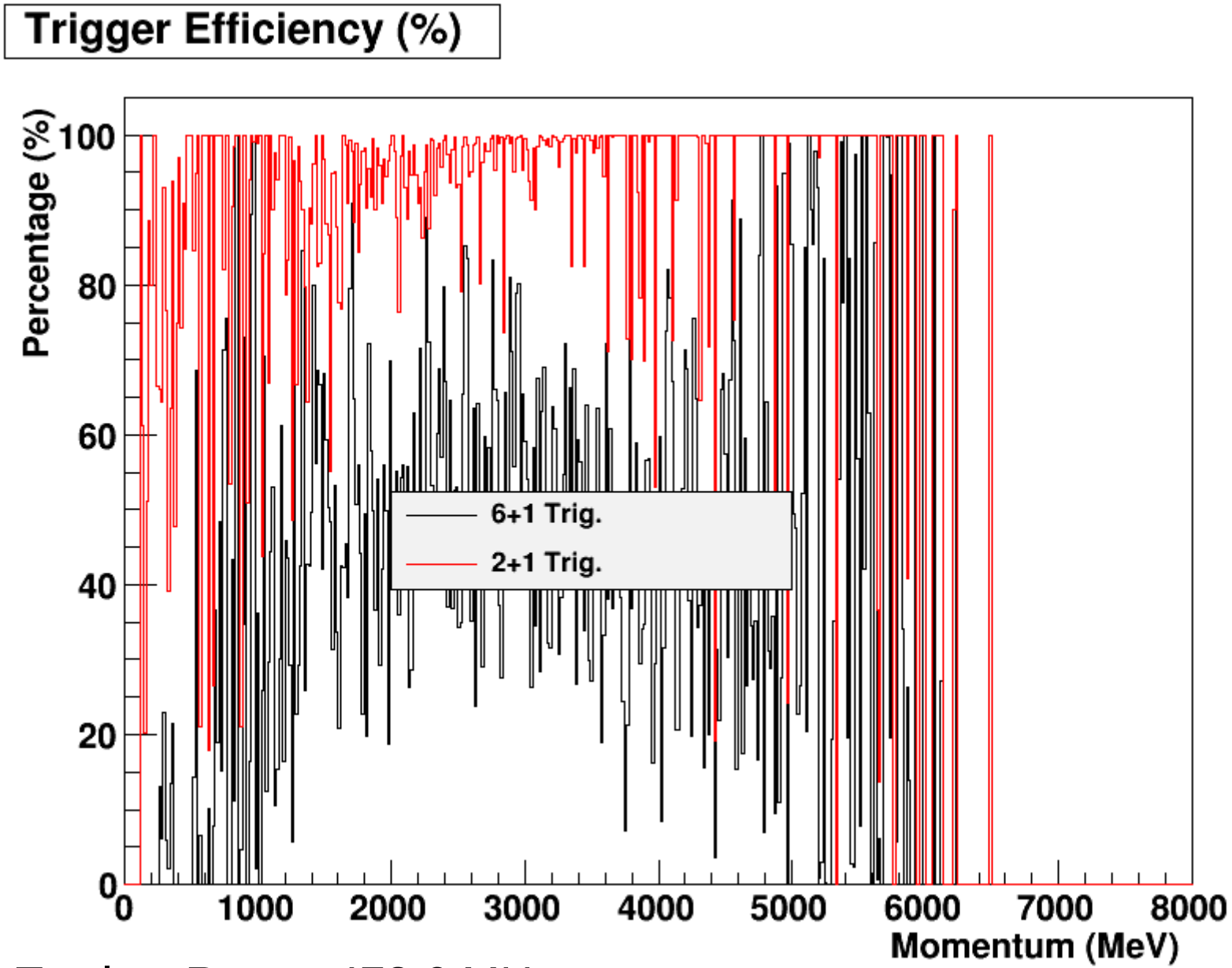
- Total π+ Rate = 263.4 MHz
- π+ Trigger Rate = 14.6 MHz (6+1 sum)

Primary π+ : 2 + 1 Sum



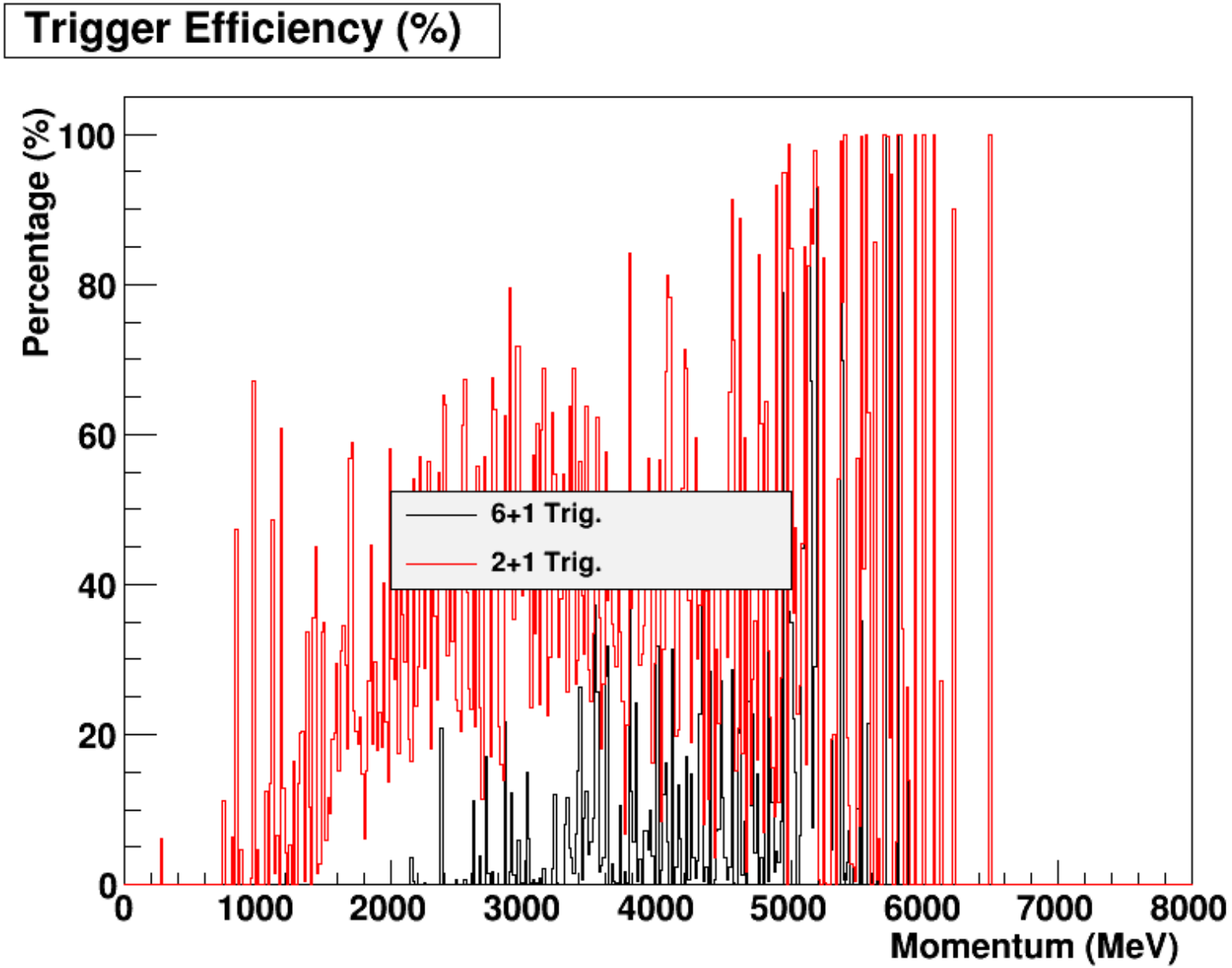
- Total π+ Rate = 263.4 MHz
- π+ Trigger Rate = 1.1 MHz (2+1 sum)

Primary π- : 6 + 1 Sum



- Total π- Rate = 473.6 MHz
- π- Trigger Rate = 93.5 MHz (6+1 sum)

Primary π- : 2 + 1 Sum



- Total π- Rate =473.6 MHz
- π- Trigger Rate = 32.5 MHz (2+1 sum)