ANOTHER UPDATE ON PVDIS BAFFLES AND PHOTON BACKGROUND

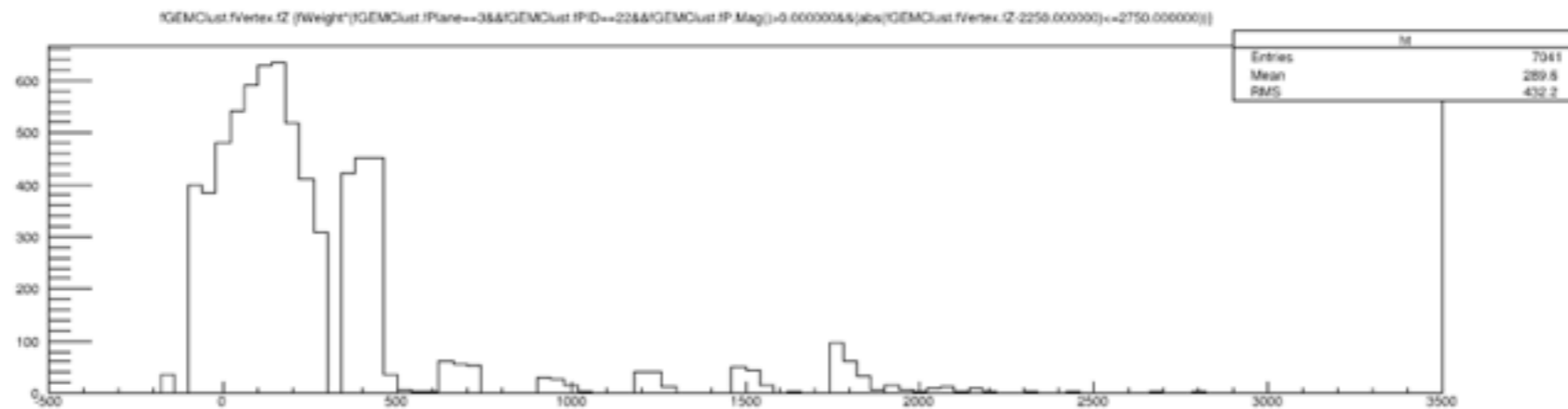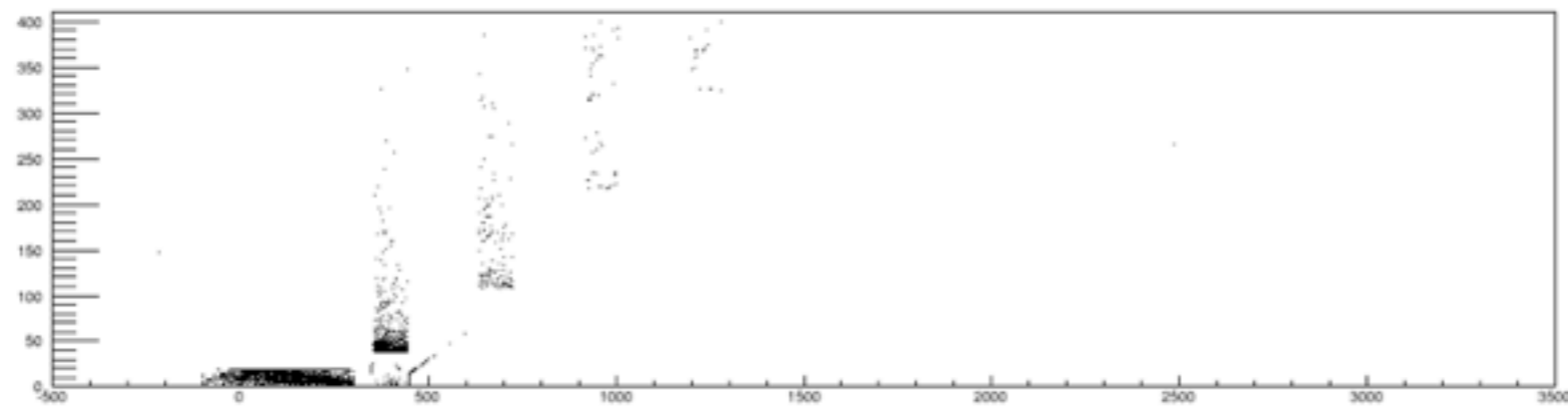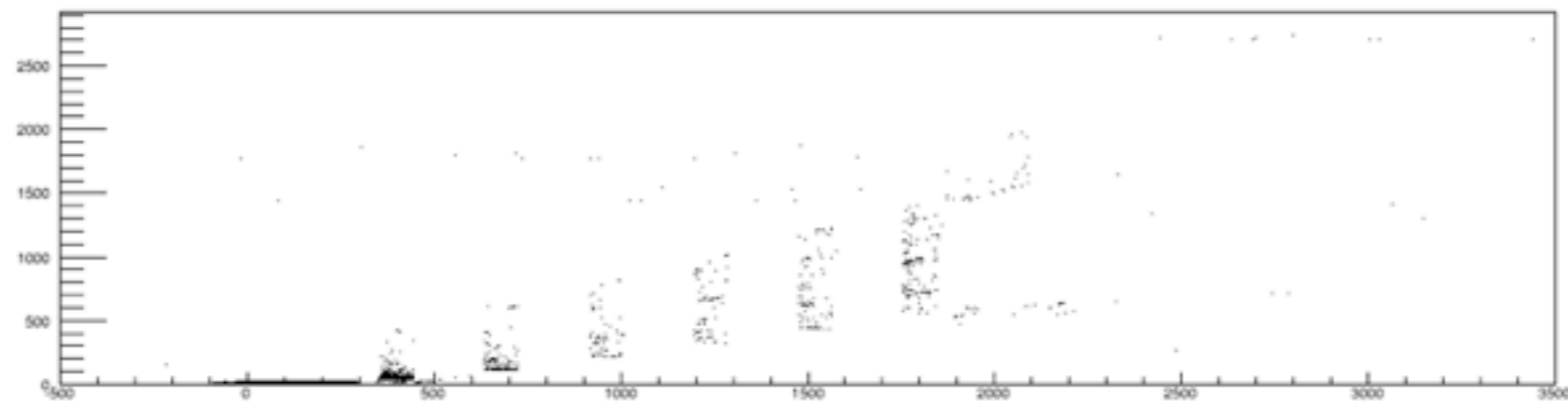Rich Holmes
Aug 06 2013 SoLID Meeting

PHOTON BACKGROUND AT LAST GEM AND ECAL

- First baffle inner diameter changed from 3.8 cm to 4.8 cm (with 2 mm inner ring)
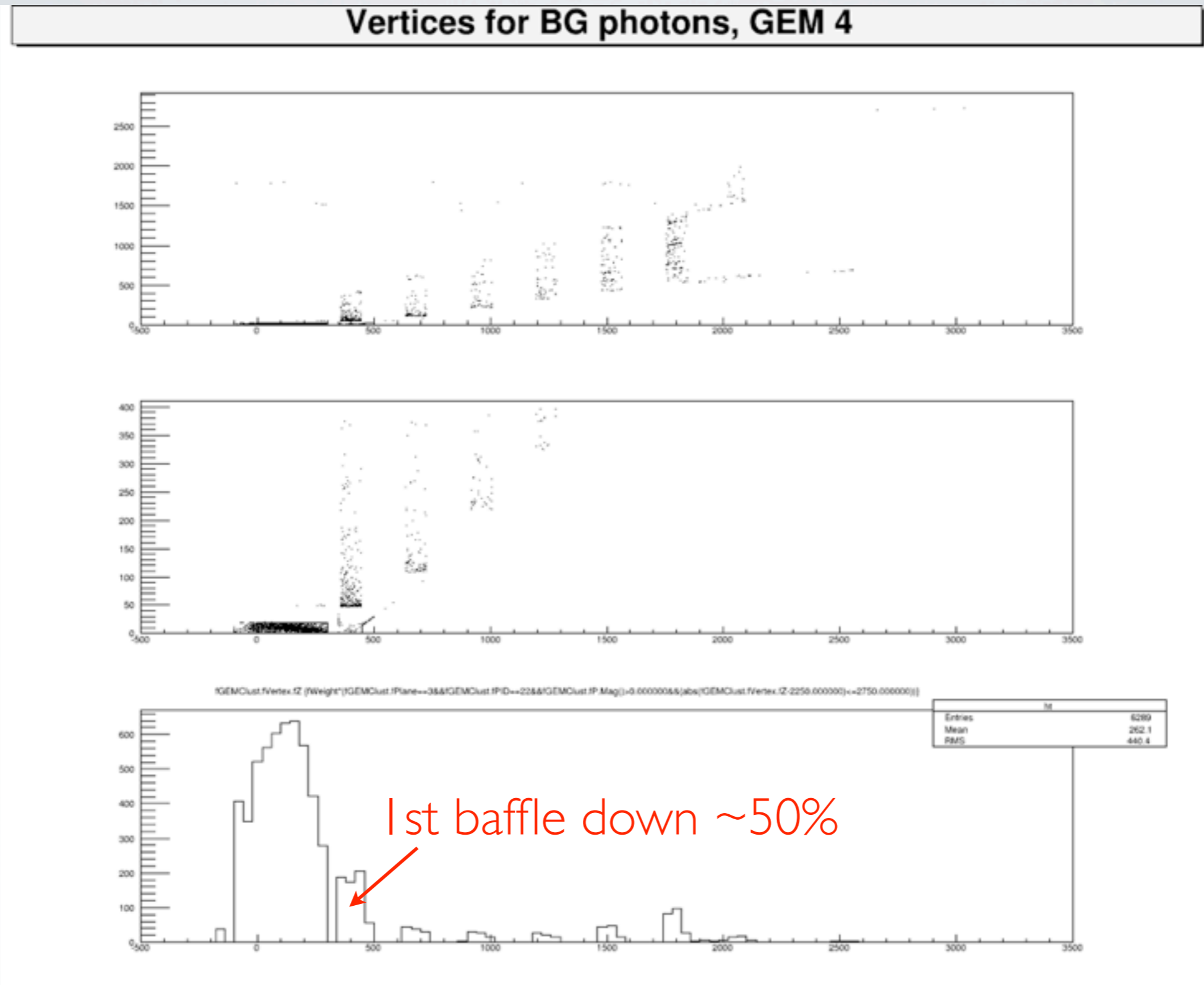
WIDE (ALUMINUM) BEAMLINE, STANDARD BAFFLES

4 cm

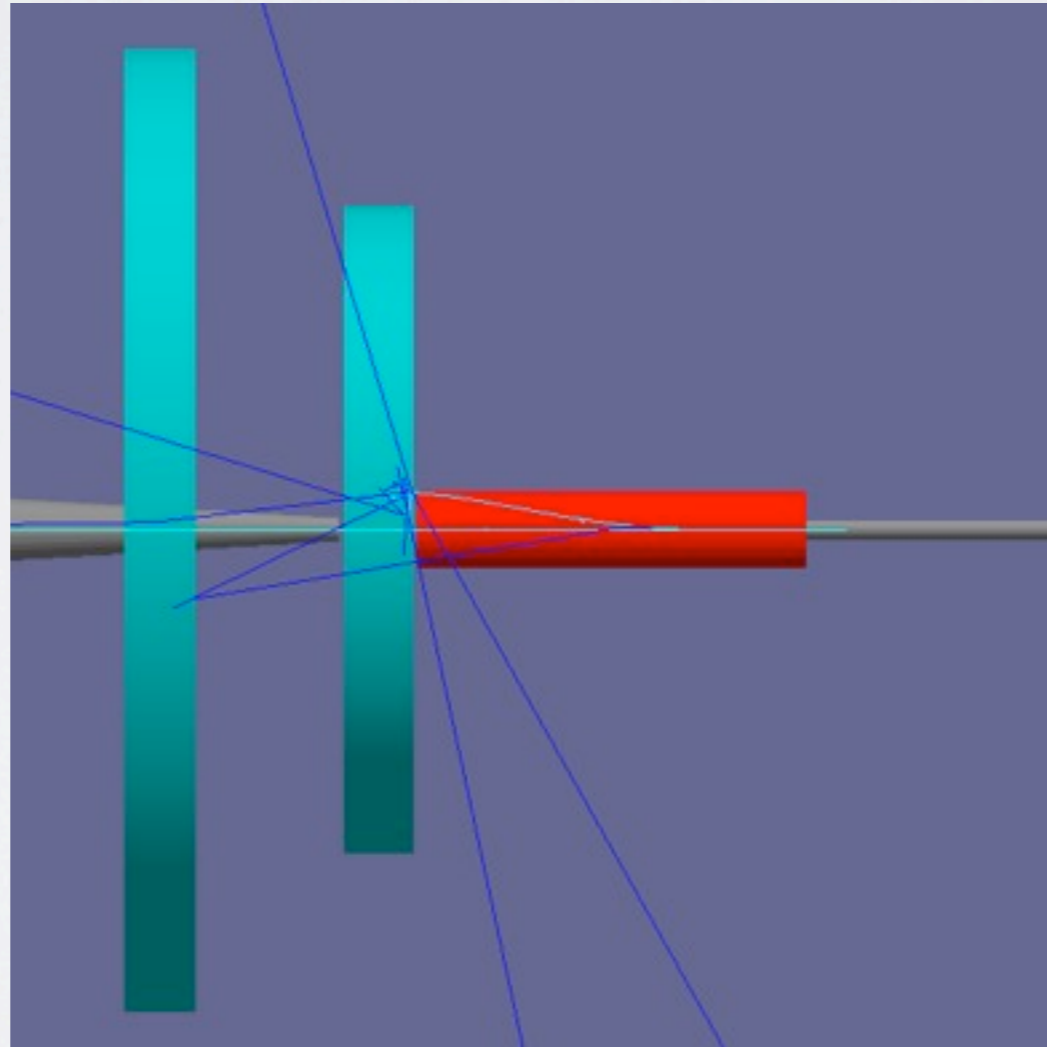Vertices for BG photons, GEM 4 CLEO standard baf, wide beamline

WIDE (ALUMINUM) BEAMLINE, STANDARD BAFFLES

5 cm

Vertices for BG photons, GEM 4

1st baffle down ~50%
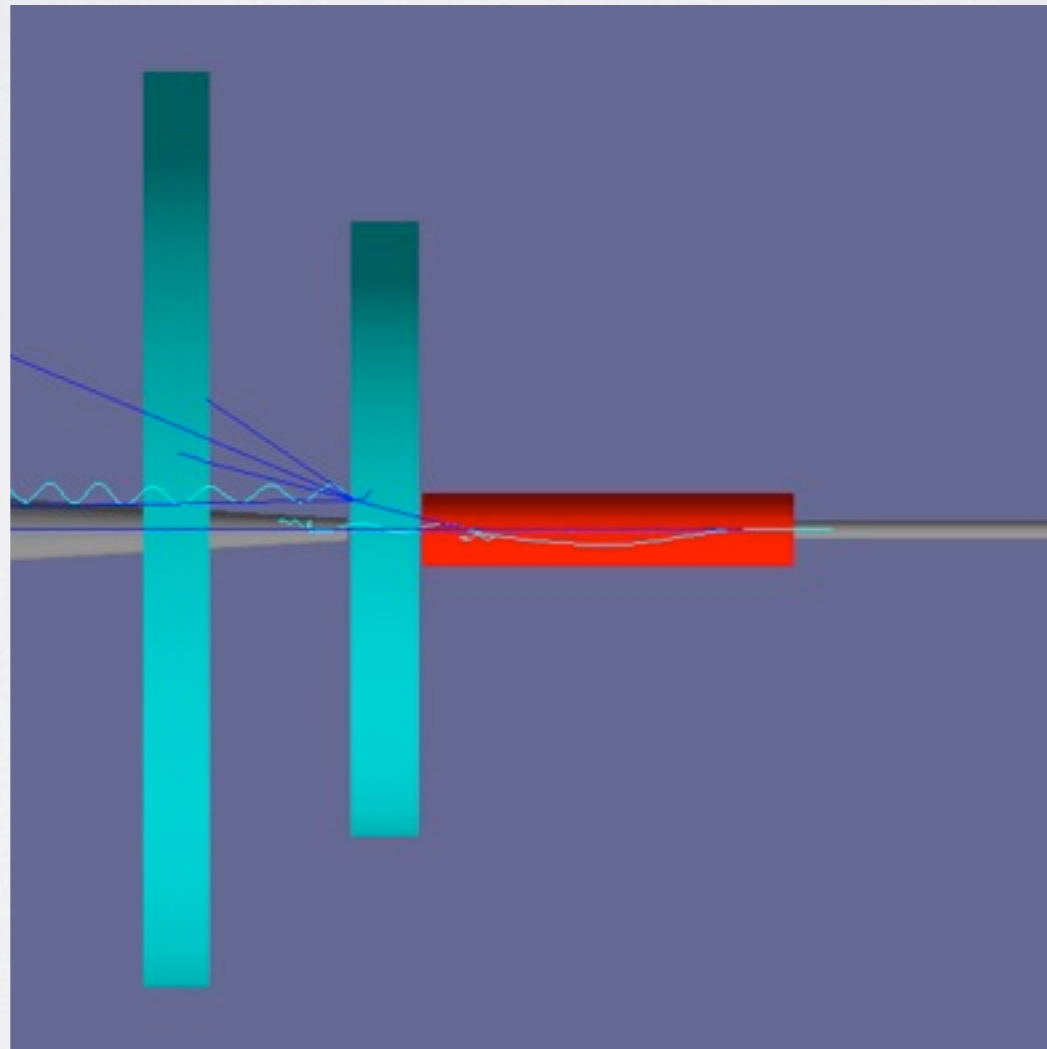
CATEGORIES OF EVENTS WITH VERTEX IN FIRST BAFFLE

- "External" Moller — creates photon in baffle (13 events for 500k e⁻ on target)

Optimized baffle design should get rid of most of these.

# CATEGORIES OF EVENTS WITH VERTEX IN FIRST BAFFLE

- "Internal" Moller — creates photon in target which interacts in baffle (6 events for 500k e⁻ on target)

Can't eliminate these, but target length, diameter, and wall construction will affect.

CATEGORIES OF EVENTS WITH VERTEX IN FIRST BAFFLE

- Hadronic interaction in target (6 events for 500k e$^-$ on target)

May produce multiple hits
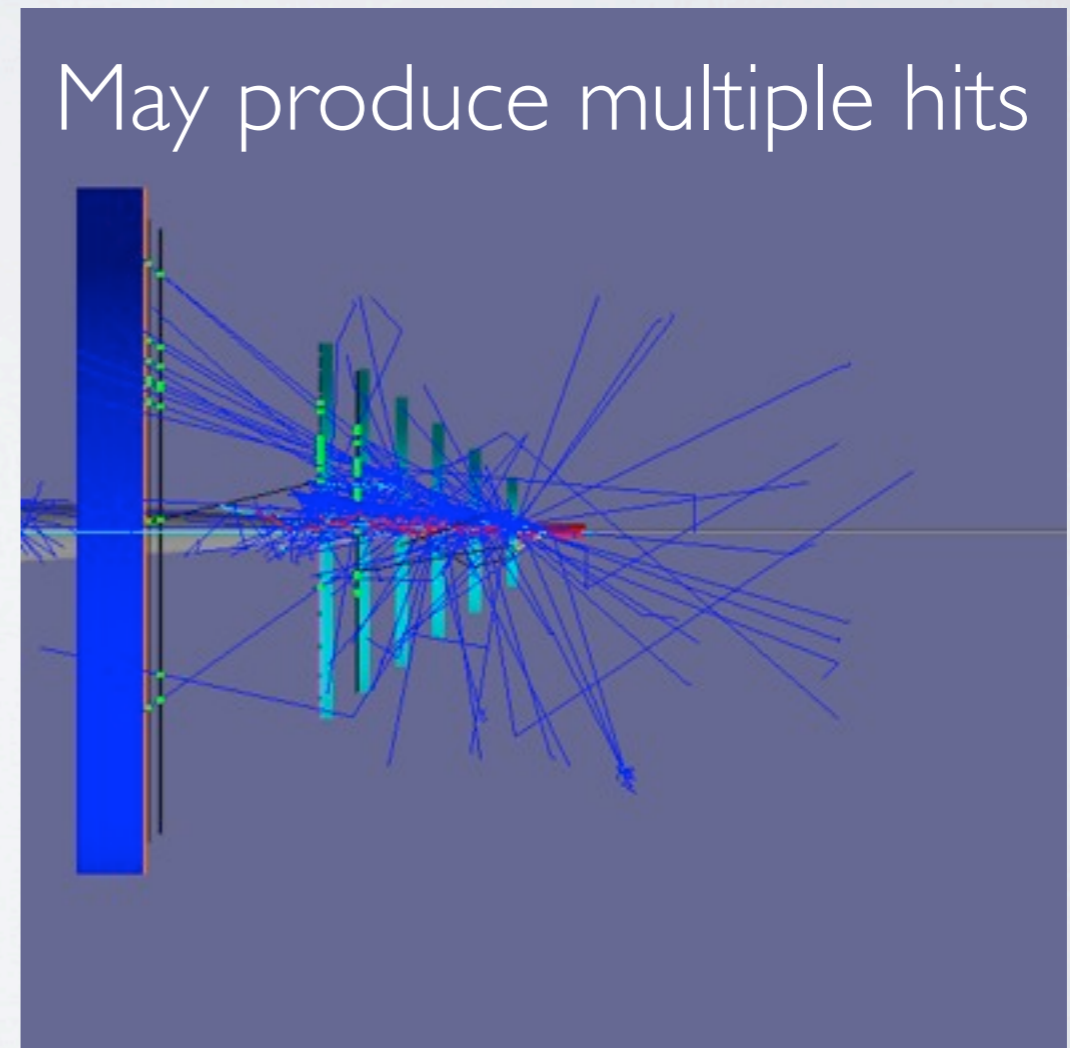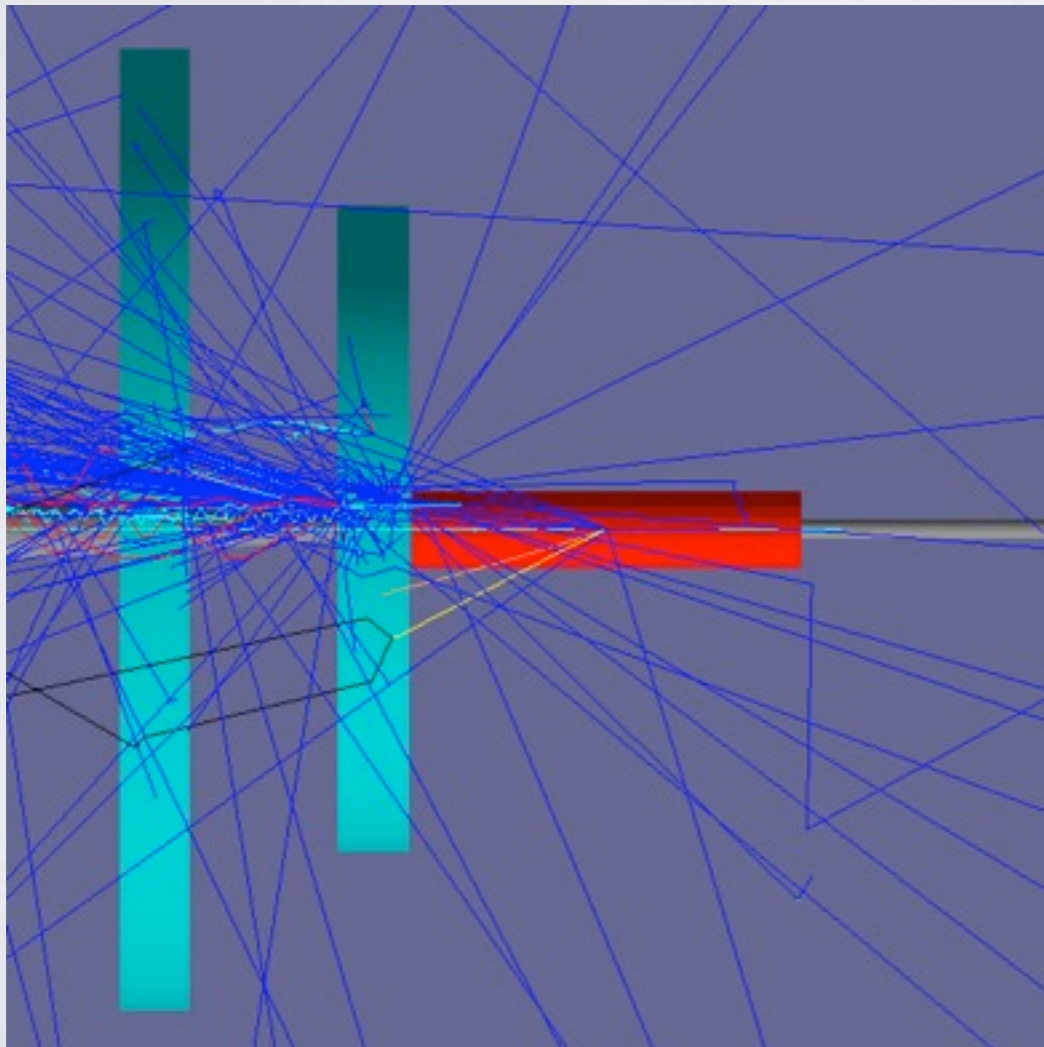
Entirely separate optimization issues

EFFECT ON STATISTICS

- We've looked at numbers of gammas and electrons per run, e.g.:

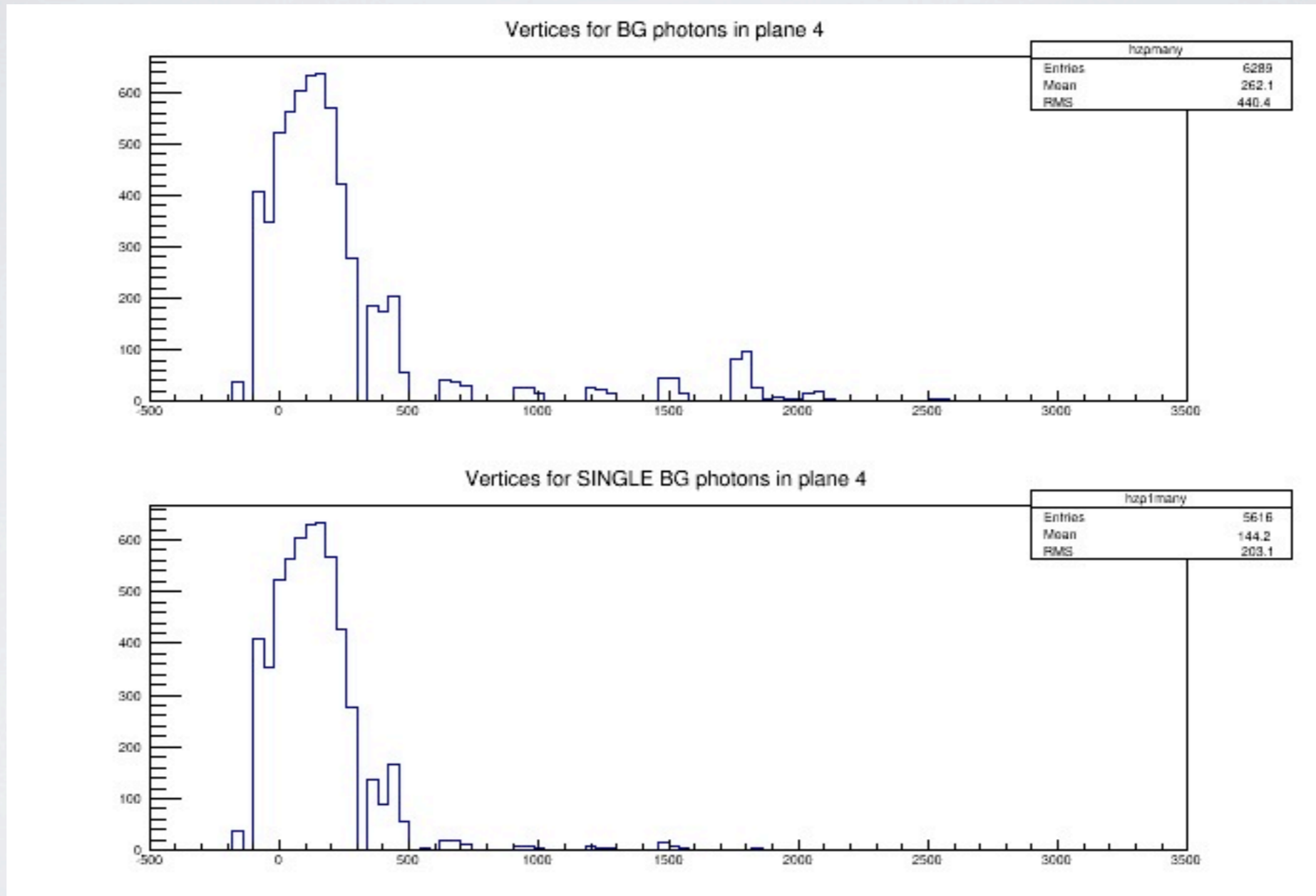|	gamma (all)	gamma (targ)	e-	eff (%)
Plane 1	20611	17687	177	0.86
Plane 2	9031	6738	91	1
Plane 3	6580	5238	64	0.97
Plane 4	6308	5024	70	1.1

- But this counts multiple hits in one event

ɣ AND e⁻ MULTIPLICITIES
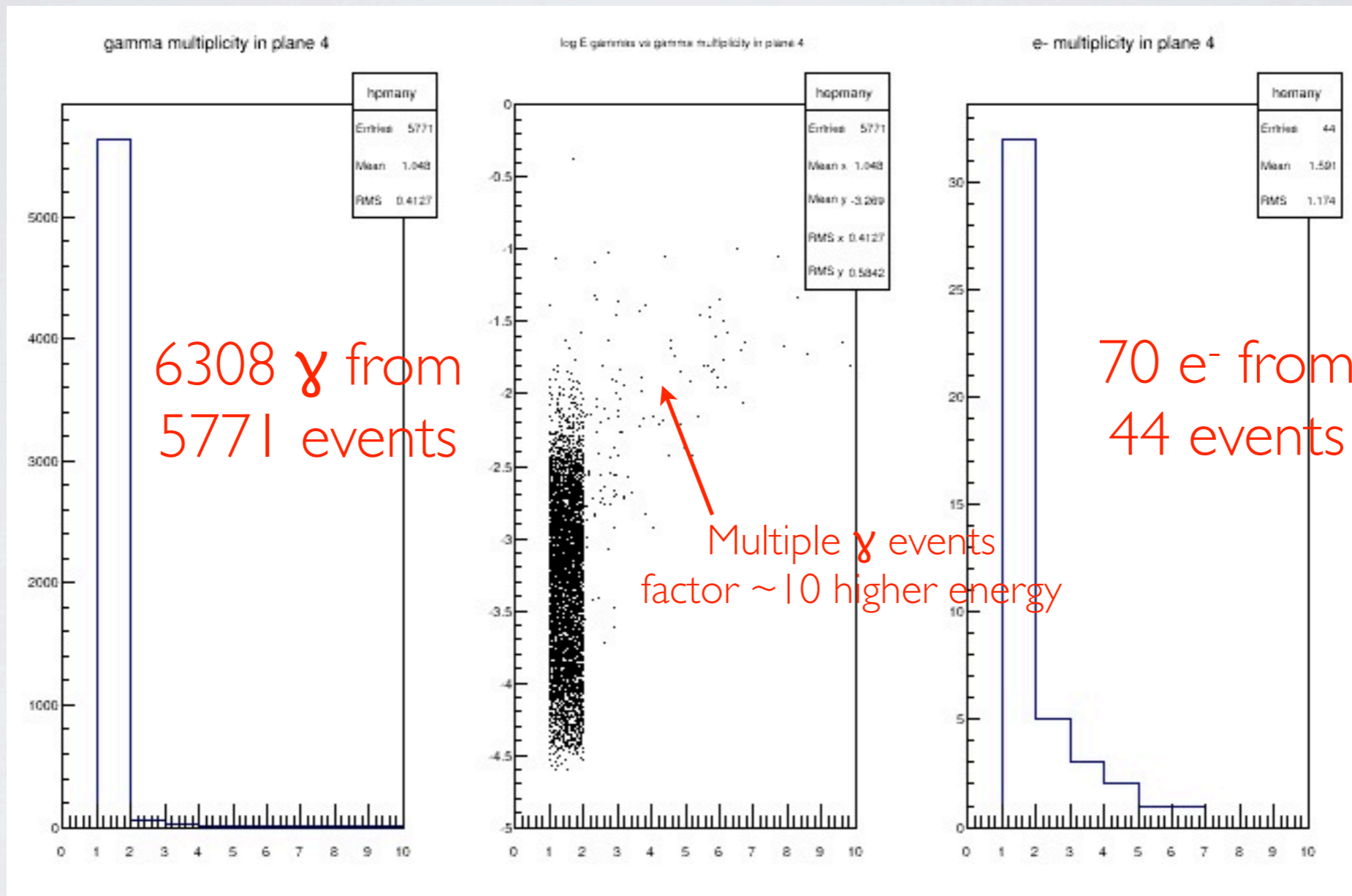
Presumably depends on what's in the physics list...

ɣ AND e⁻ MULTIPLICITIES

TO DO

- Migrate to modern physics list and see effect on e^- counts

- Look at events with vertices in downstream baffles (mostly hadronic?)

- Events with vertex in target but affected by baffles?