Beam Positions for the full map beam line.

Beam positions in the pair spectrometer magnet were determined with GEMC, using virtual detectors at various locations along the beam.

1. I first needed to fix the table: hps_beamline to reduce the length of the ps_field volume. This stuck out into the detector. (Done on Improv)
2. Fix up and add FLUX detectors in the monitor table to "measure" the beam position.
3. Run 10000 electrons through and analyze.

Beam Line Modification

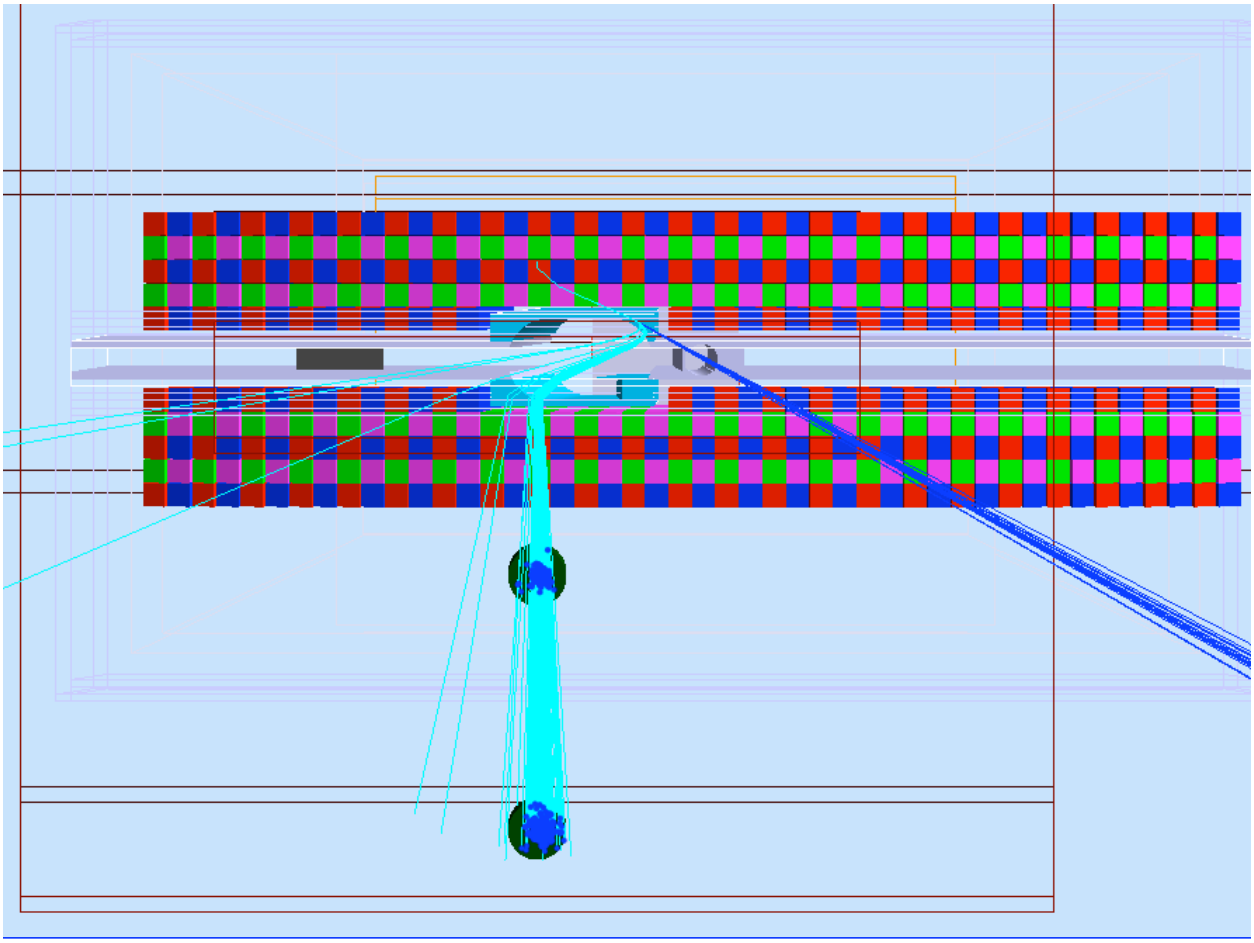
To allow for flux detectors and the like the hps_beamline table needed modifying:

```
mysql> delete from hps_beamline where name like "%_field";
Query OK, 3 rows affected (0.00 sec)

mysql> insert into hps_beamline select * from hps_beamline_fast where
  name like "%_field";
Query OK, 3 rows affected (0.00 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

This gives the ps_field box the same dimensions as in the hps_beamline_fast table, allowing for FLUX detectors to function.

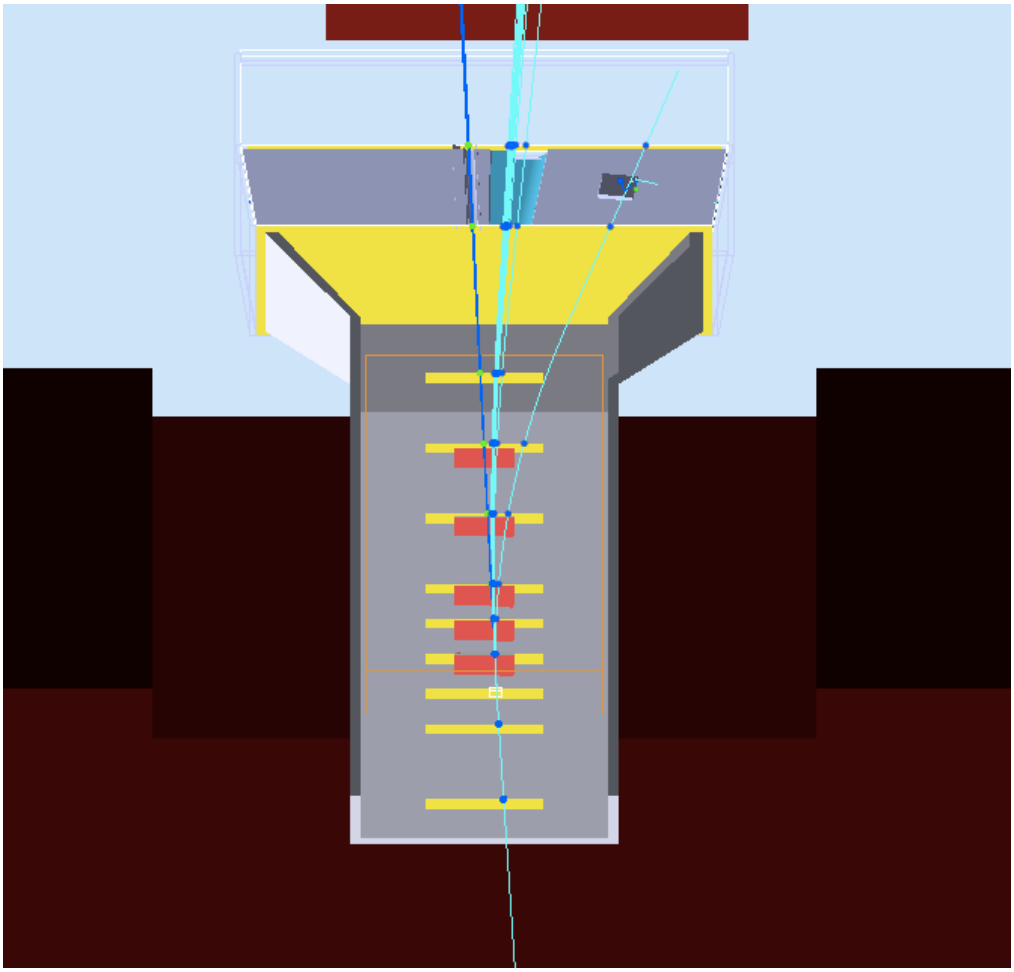
The picture shows that the beamline still hits the bull's eye.



Beam Alignment June 4 2011.png

Location of beam monitor detectors

Each of the yellow rectangles represents a beam monitor detector. The blue dots are hits by an electron (blue green lines) the green dots by a photon (blue lines)



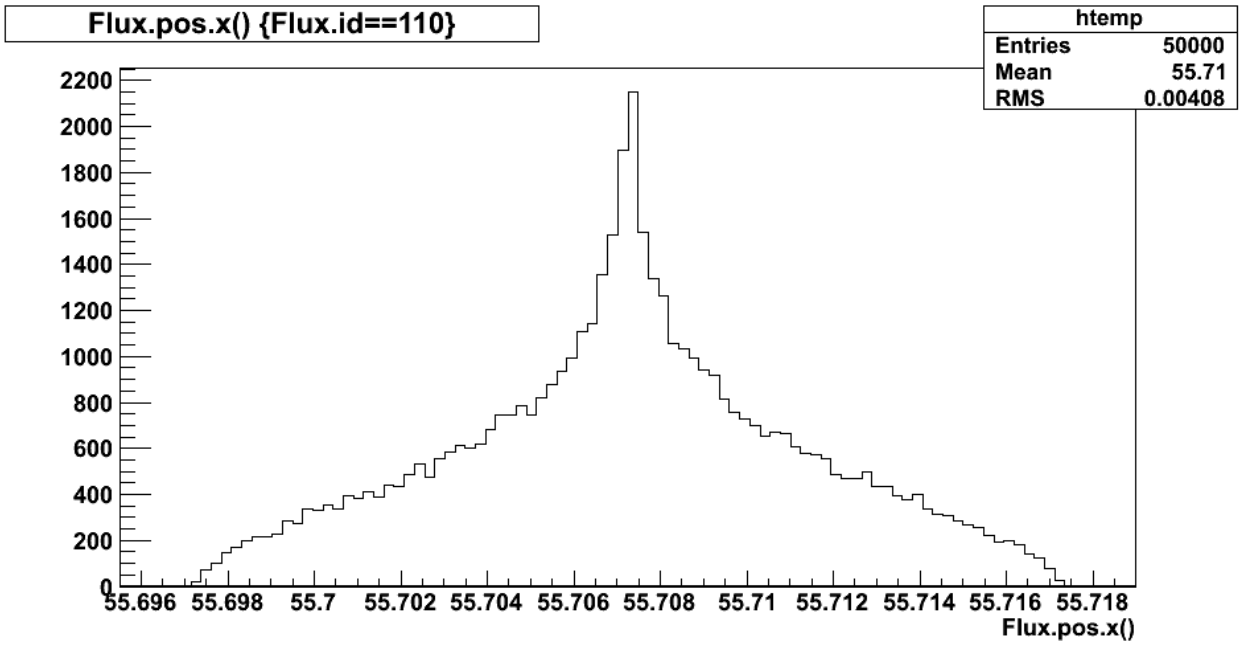
Beam Positions.

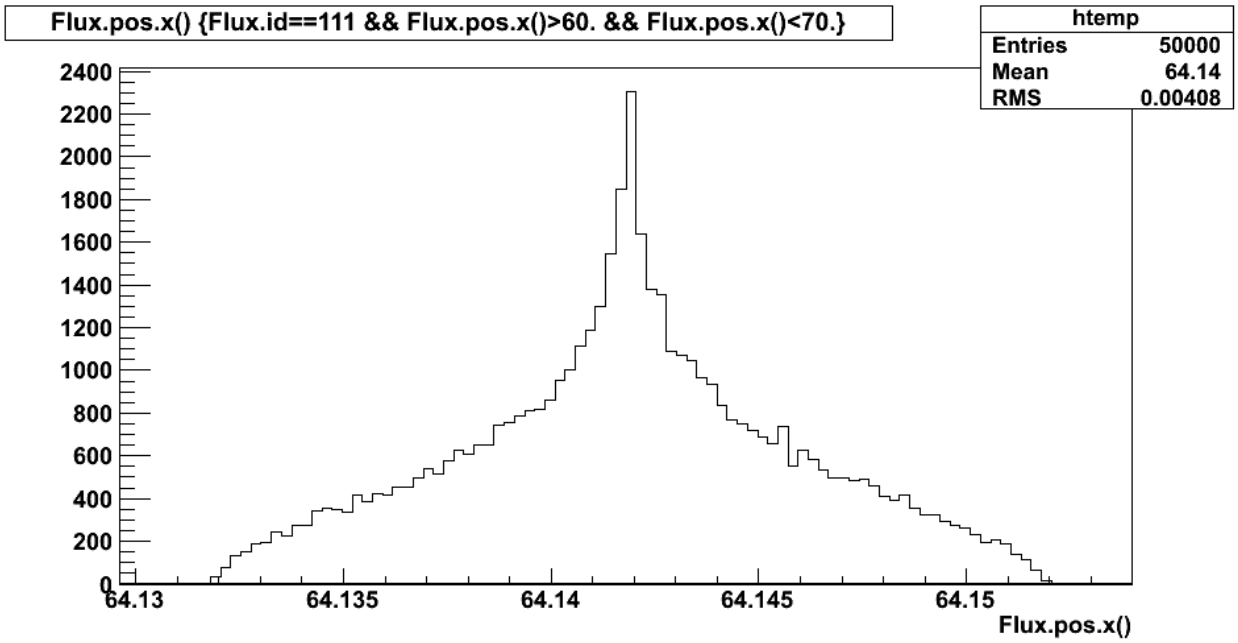
Results for Electron Beam

Name	Z Pos	X Pos	Local Z pos	Local X pos
A1 - 110	-314.2 mm	55.71 mm		-32.78 mm
A2 - 111	-100 mm	64.14 mm		-24.34 mm
B1 - Target (+2 mm)	2 mm	67.67		-20.82 mm
A3 - 112 Silicon 1	+100 mm	70.4 mm	-400 mm	-18.1 mm
A4 - 113 Silicon 2	+200 mm	72,49 mm	-300 mm	-16. mm
A5 - 114 Silicon 3	+300 mm	73.91 mm	-200 mm	-14.85 mm
A6 - 115 Silicon 4	+500 mm	74.71 mm	0 mm	-13.79 mm
A7 - 116 Silicon 5	+700 mm	72.77 mm	+200 mm	-15.72 mm
A8 - 117 Magnet Exit	+900.1 mm	68.12 mm	+400 mm	-20.38 mm
B3 - 12 Ecal Entry	1319 mm	52.28 mm		-36.24 mm
B4 - 13 Ecal Middle	1549 mm	43.25 mm	-135 mm	-45.27 mm

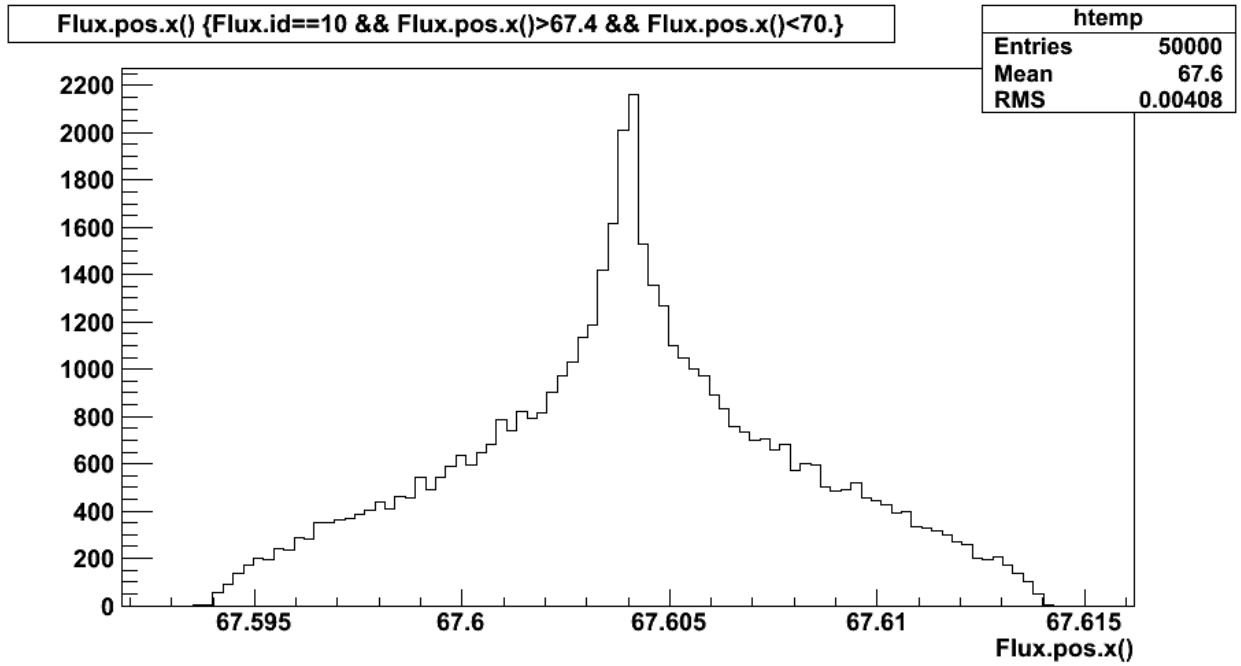
Results for Photon Beam

Name	Z Pos	X Pos	Local Z pos	Local X pos
A1 - 110	-314.2 mm	-		
A2 - 111	-100 mm	-		
B1 - 10 Target	0 mm	-		
A3 - 112 Silicon 1	+100 mm	70.73 mm	-400 mm	-17.75 mm
A4 - 113 Silicon 2	+200 mm	73.86 mm	-300 mm	-14.63 mm
A5 - 114 Silicon 3	+300 mm	76.98 mm	-200 mm	-11.5 mm
A6 - 115 Silicon 4	+500 mm	83.23 mm	0 mm	-5.26 mm
A7 - 116 Silicon 5	+700 mm	89.48 mm	+200 mm	0.99 mm
A8 - 117 Magnet exit	+900.1 mm	95.73 mm	+400 mm	7.24 mm
B3 - 12 Ecal Entry	1319 mm	108.8 mm		20.33 mm
B4 - 13 Ecal Middle	1549 mm	116. mm	-135 mm	27.52 mm

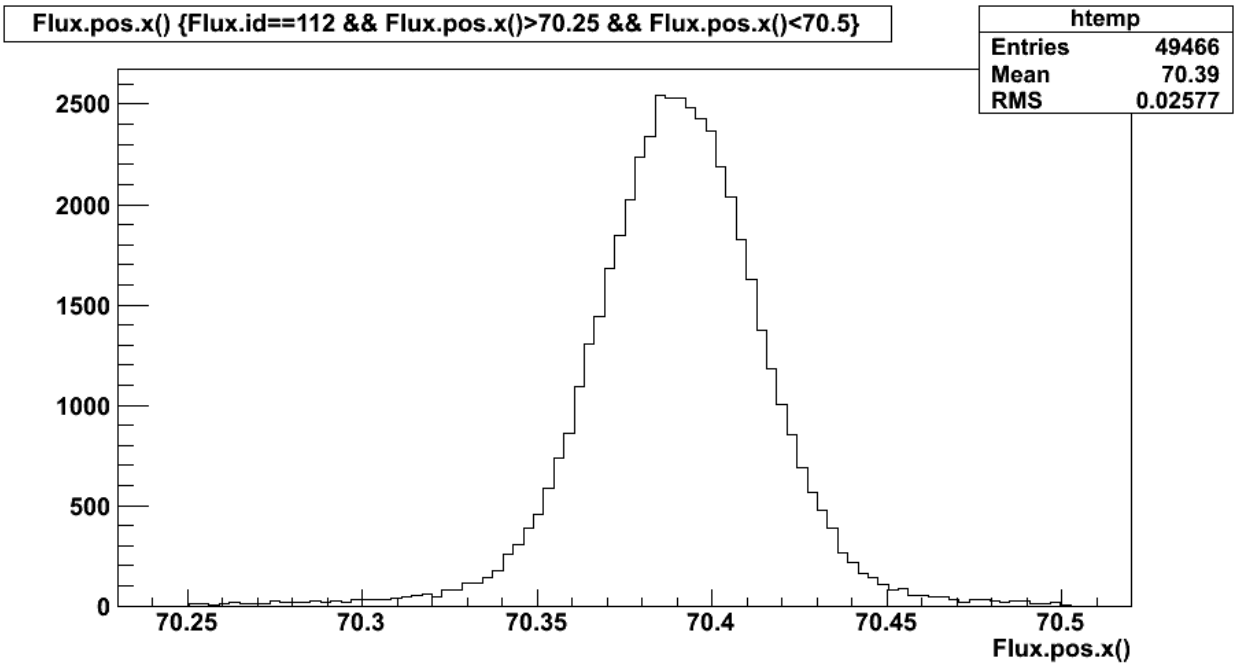




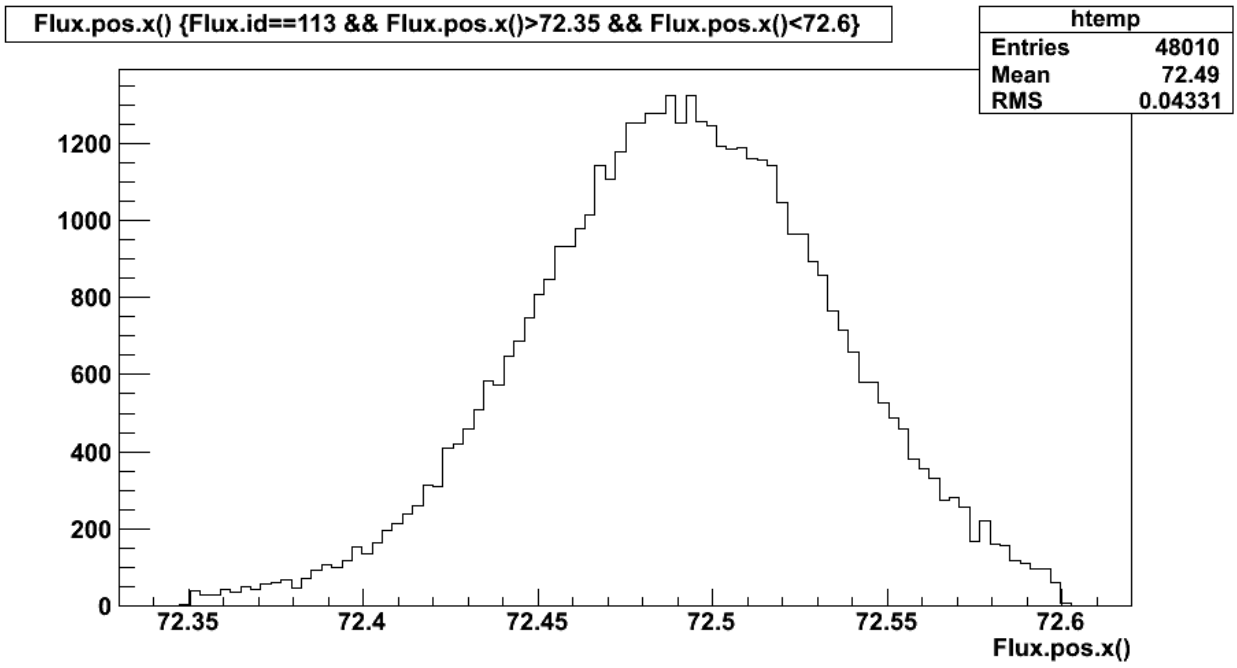
TARGET:



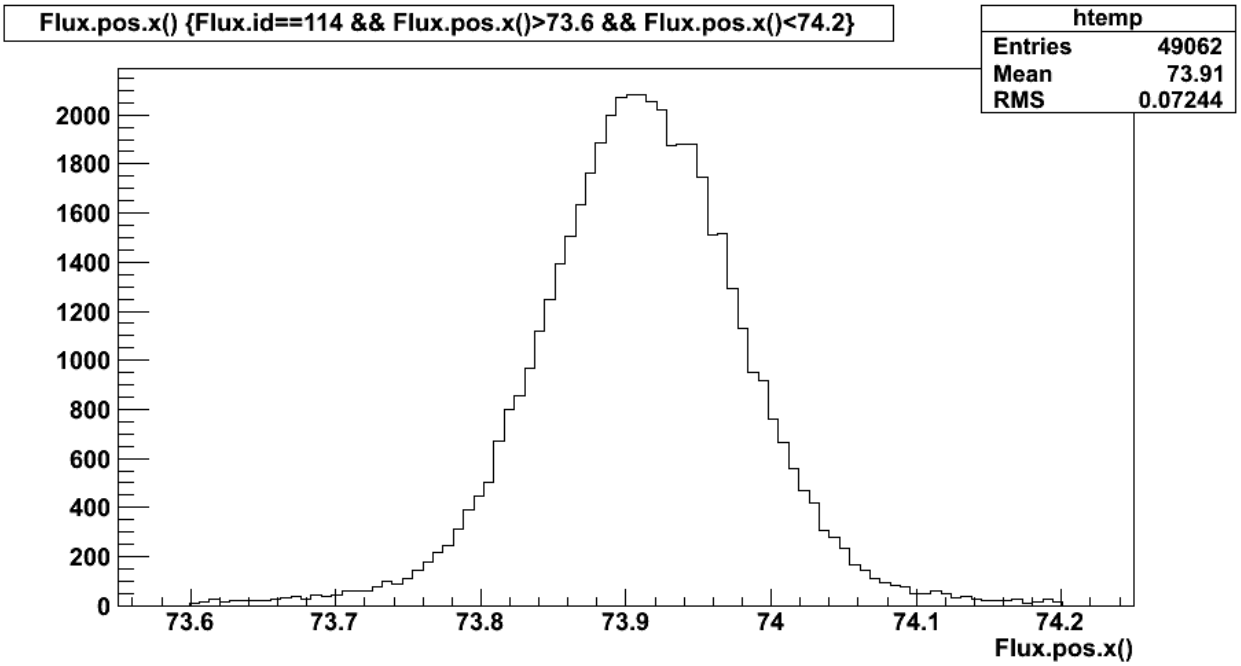
Silicon 1:



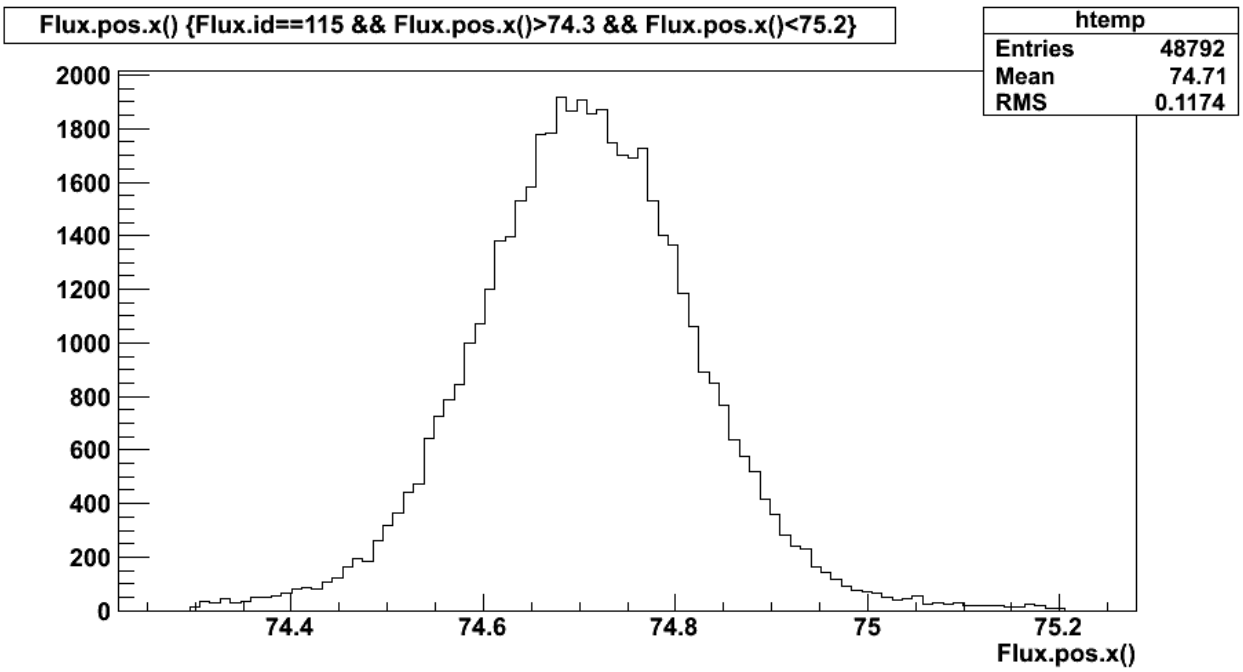
Silicon 2



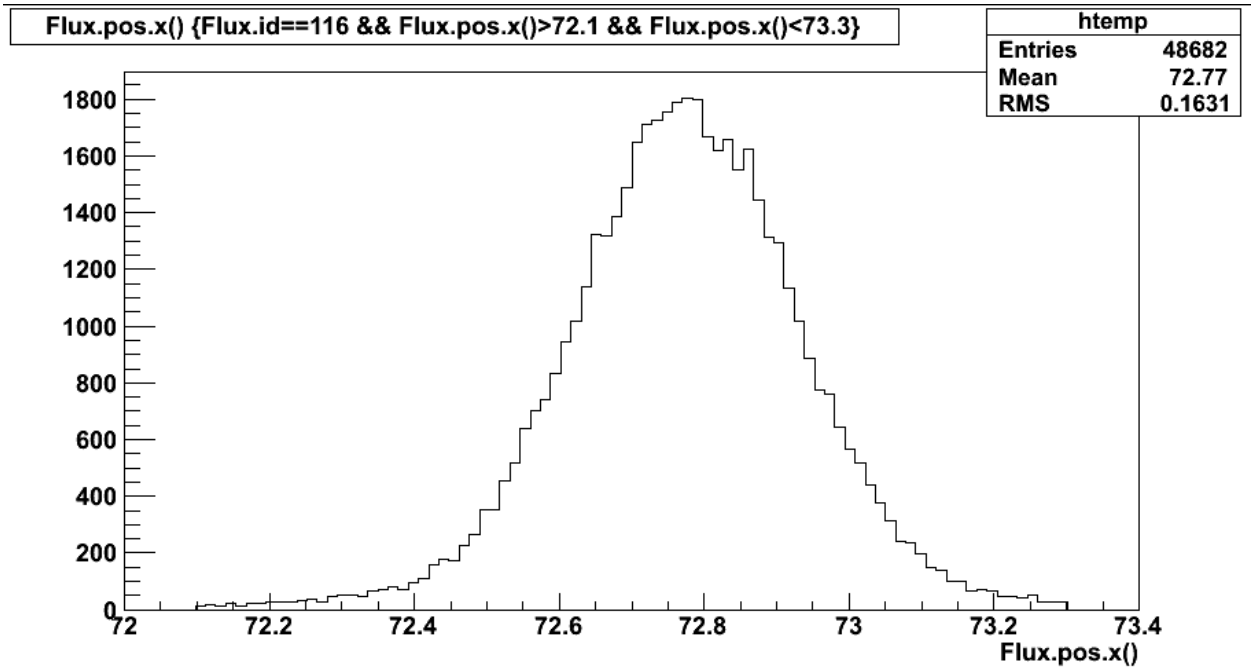
Silicon 3



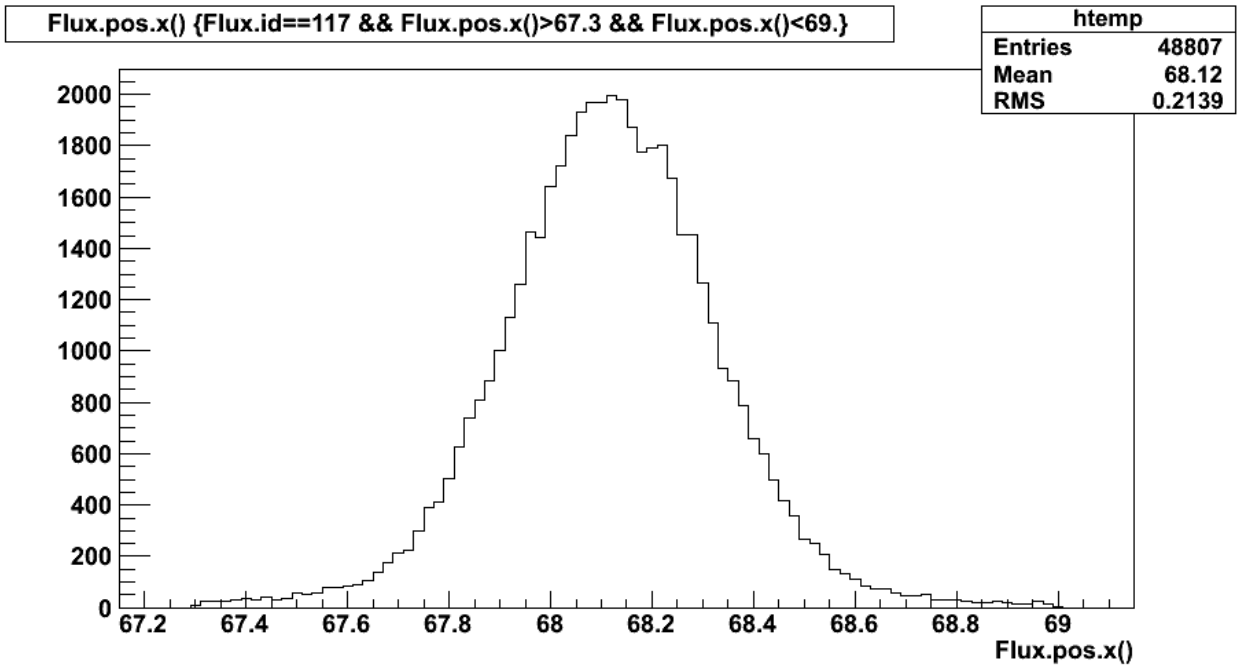
Silicon 4



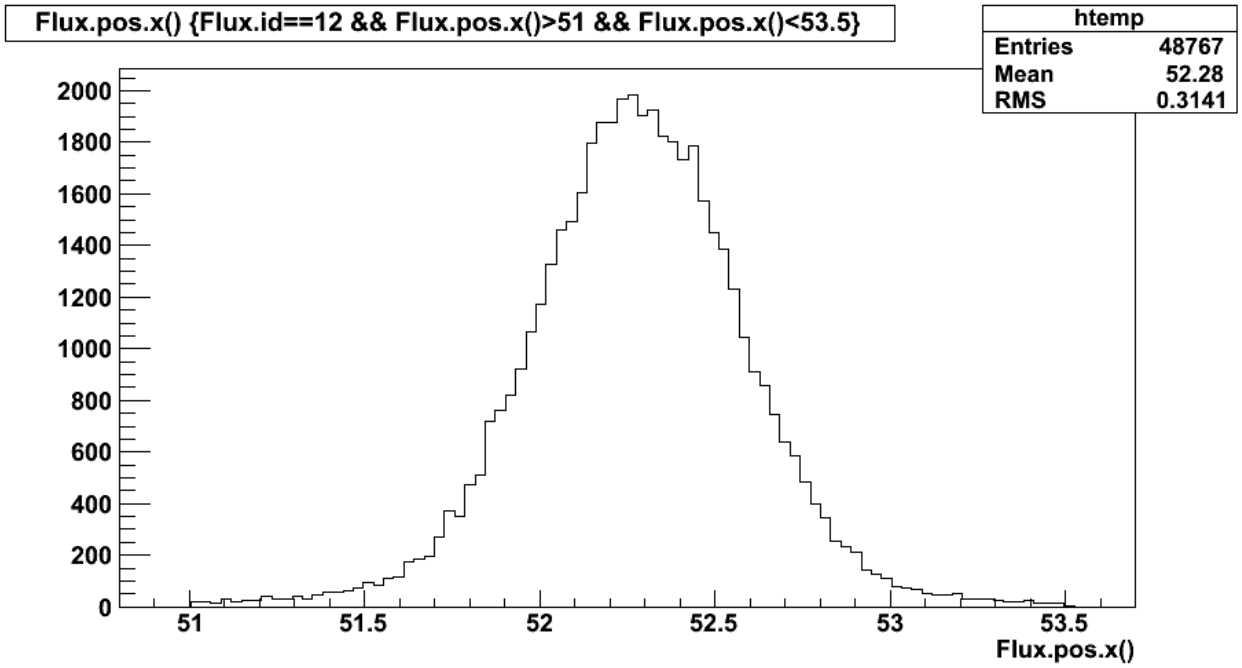
Silicon 5



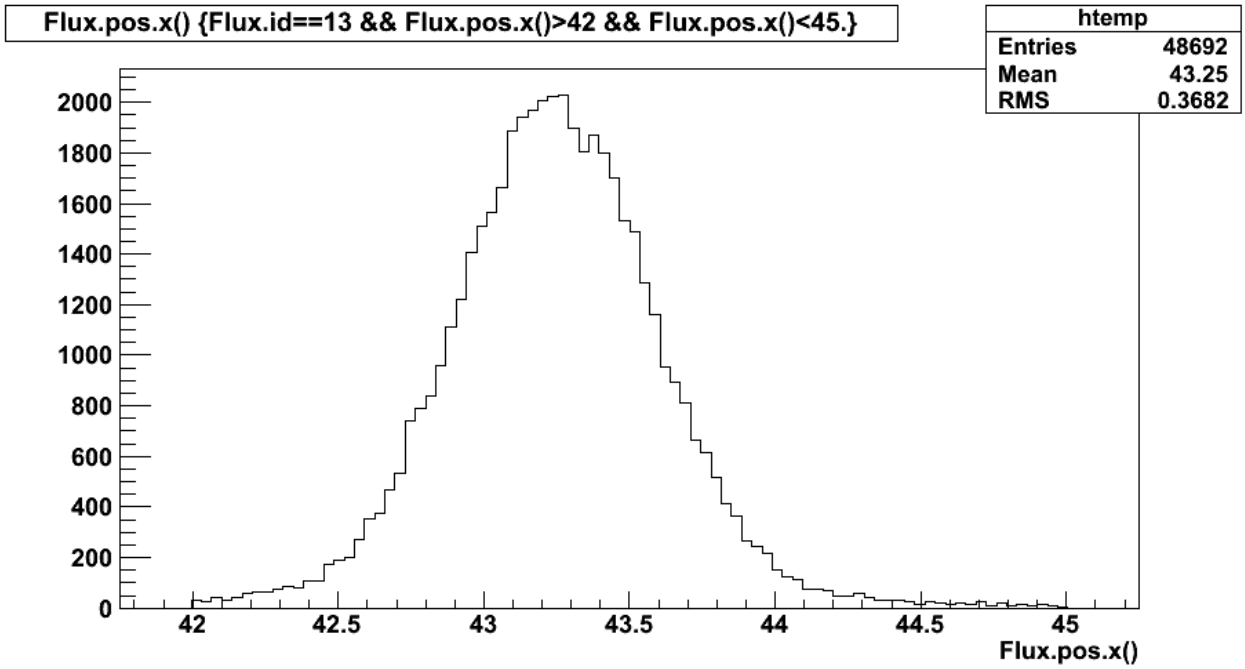
Magnet Exit



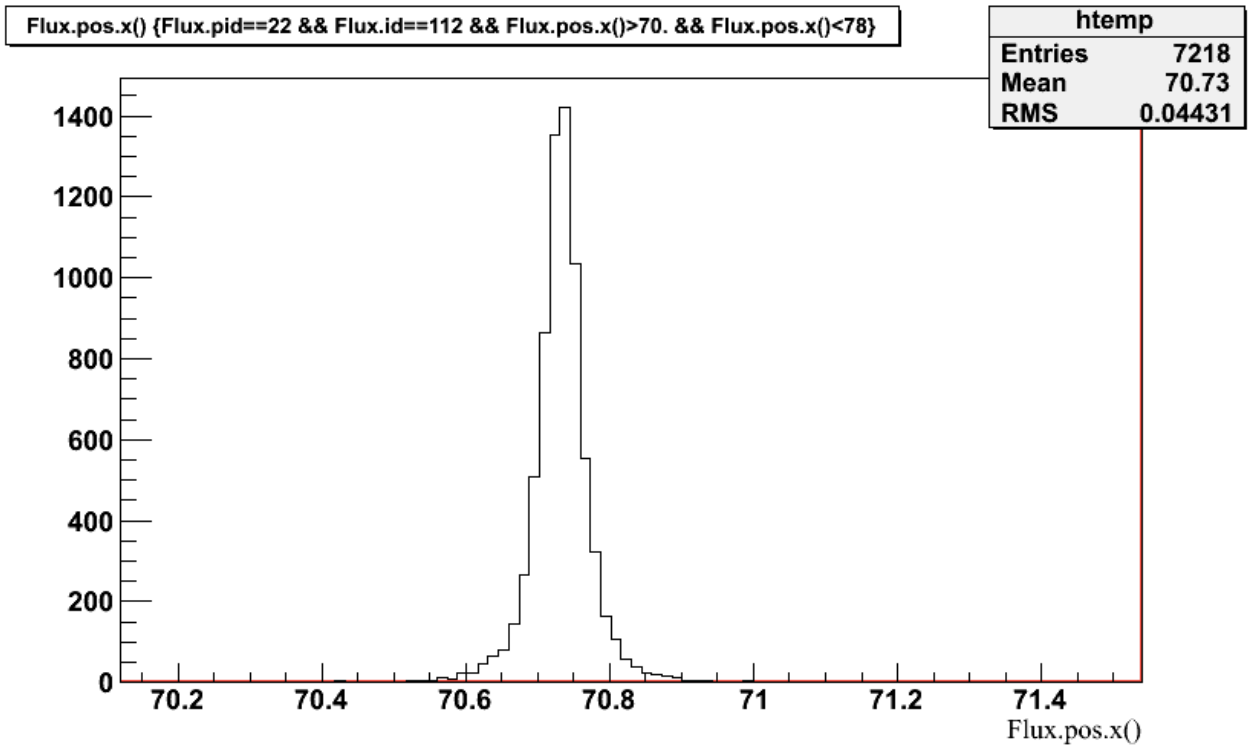
ECal Entry



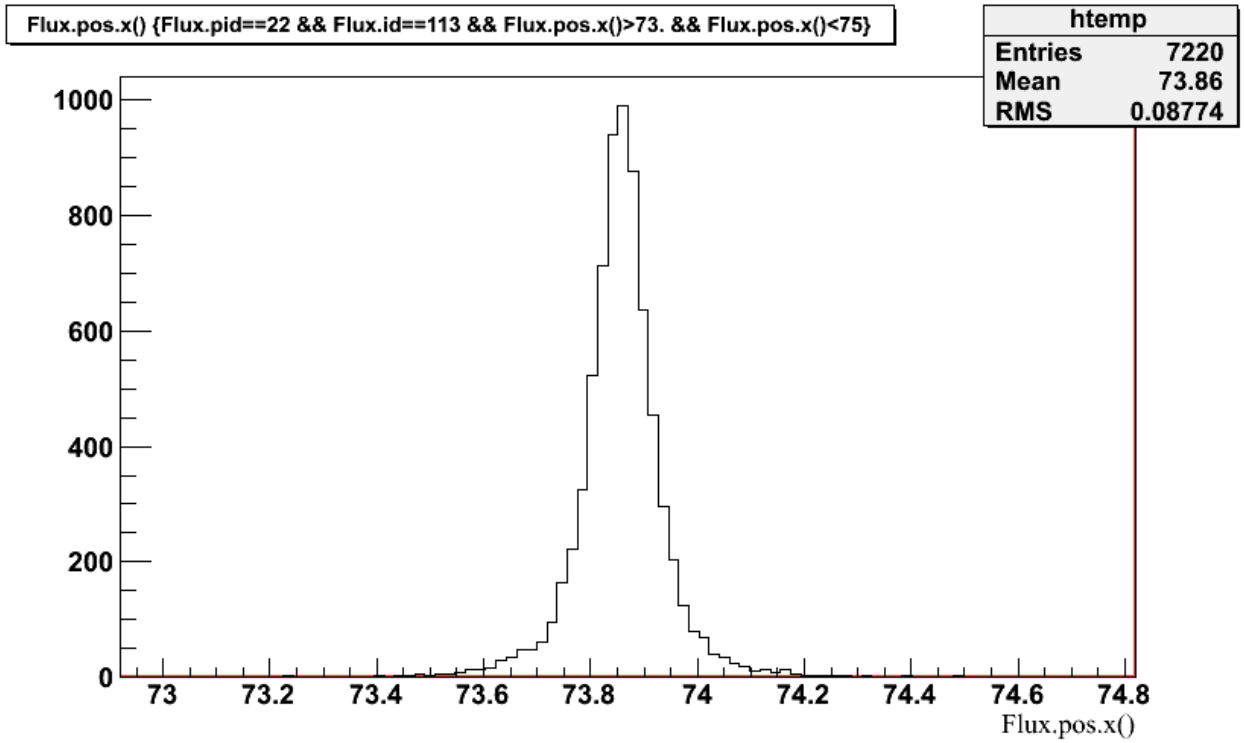
Ecal Exit



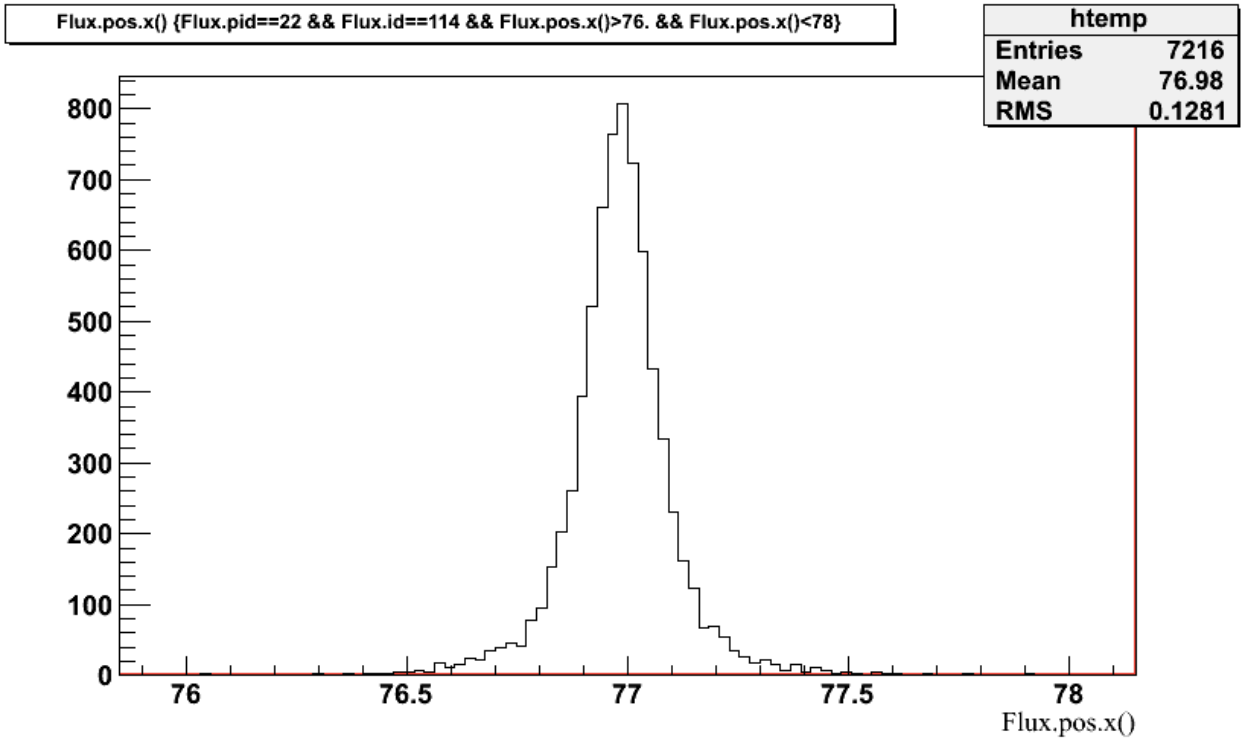
Photons at Silicon 1



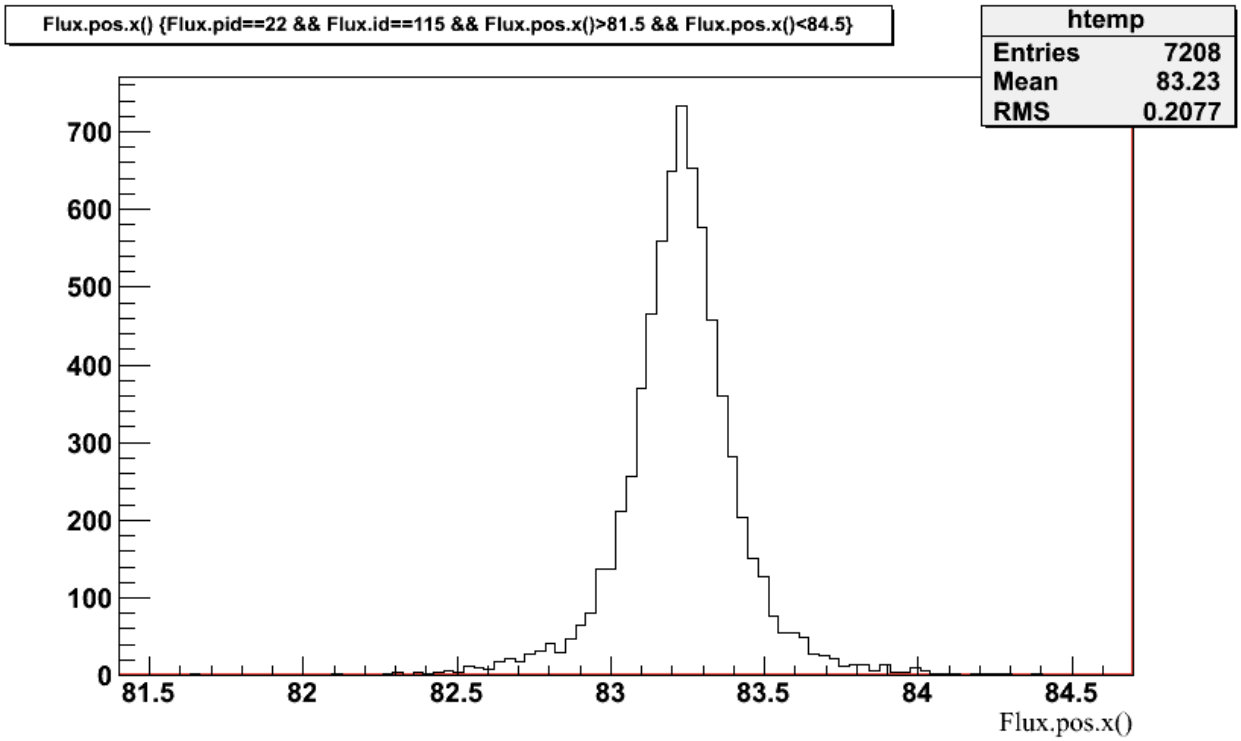
Photons atSilicon 2



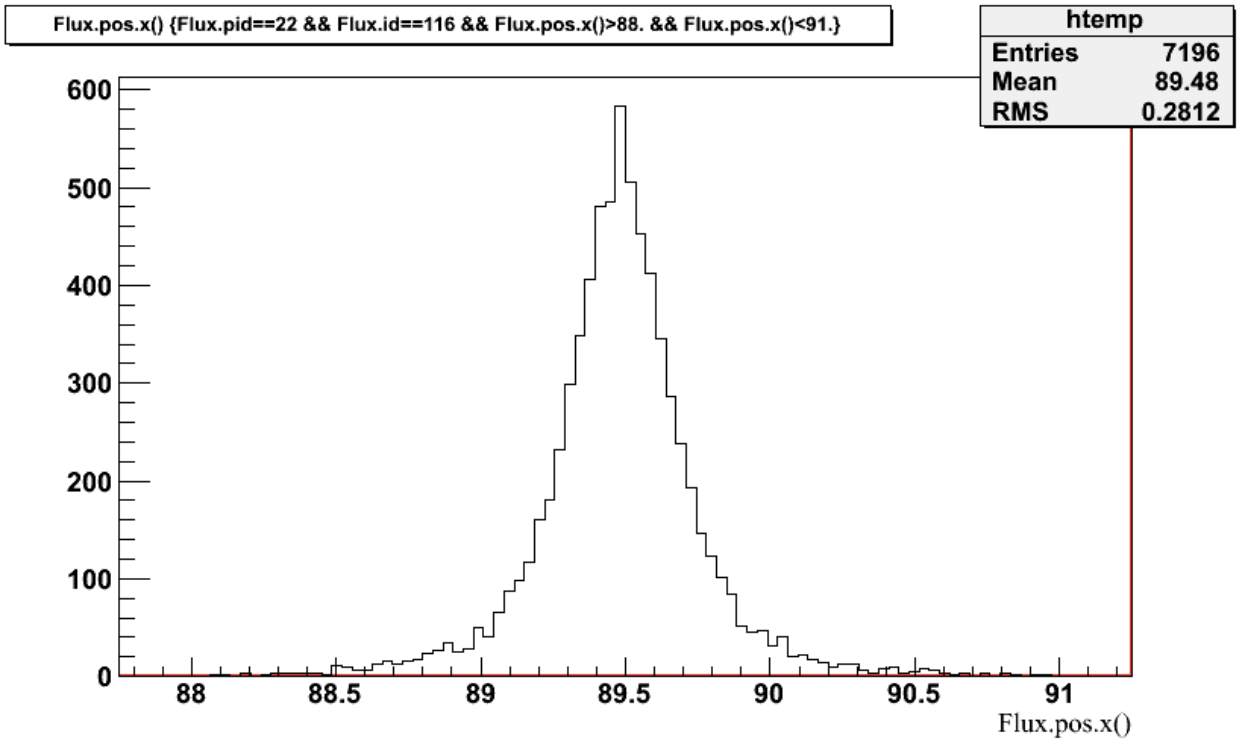
Photons at Silicon 3



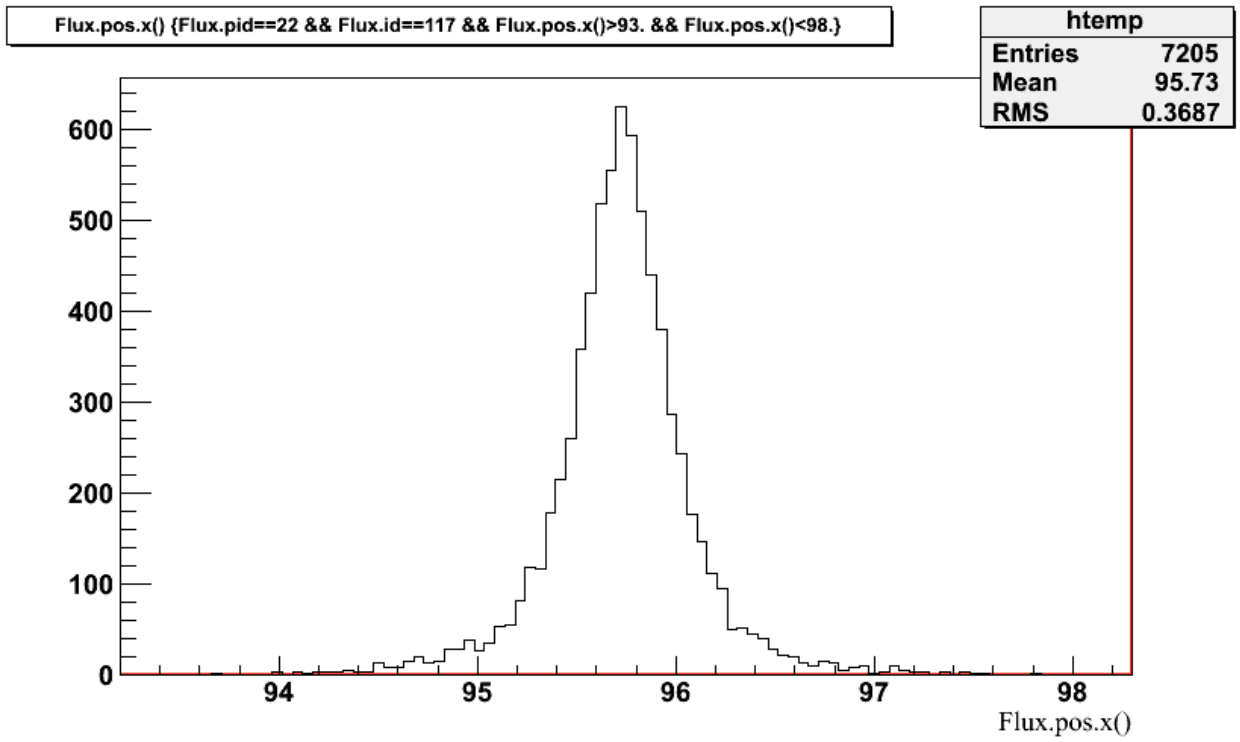
Photons at Silicon 4



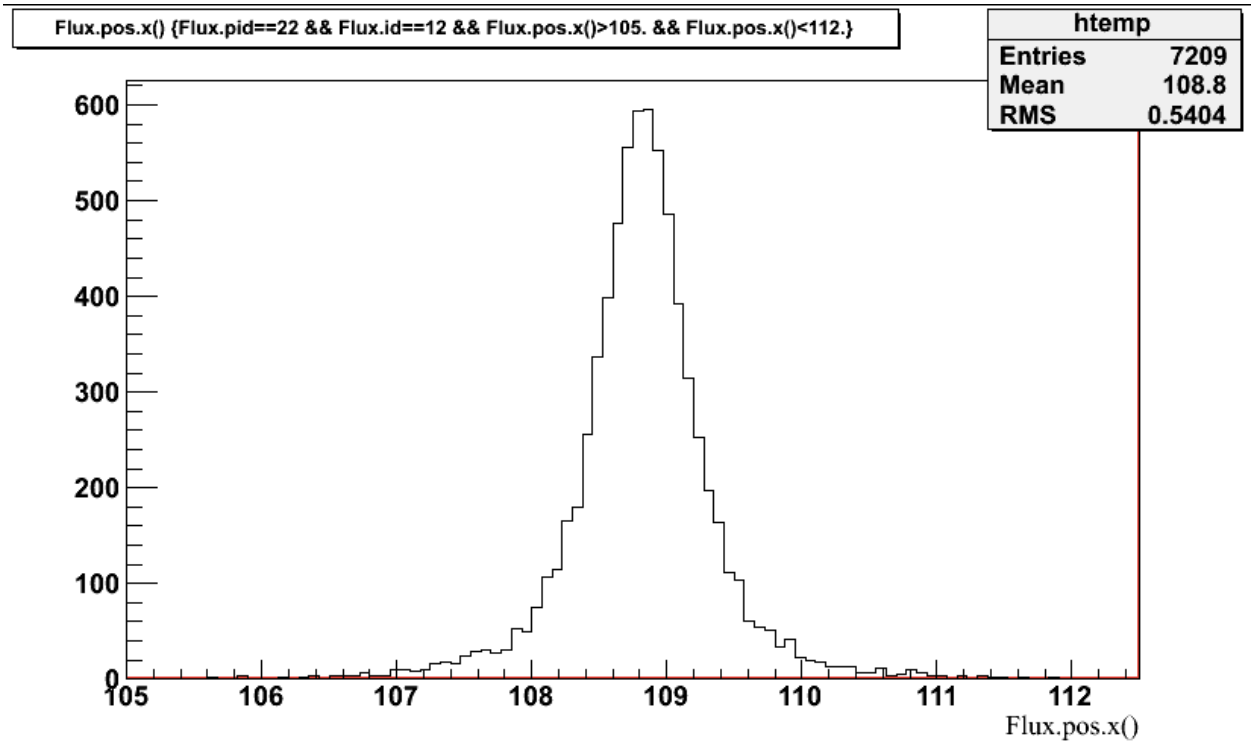
Photons at Silicon 5



Photons at Magnet Exit



Photons at Ecal Entrance



Photons at Ecal middle