# Secondary Study

### **Discussion:**

- After yesterdays meeting, we decided to perform a simple study with MC/bggen to see what the distributions of secondary photons look like compared to thrown photons.
- We also decided to look at how many thrown events we would lose by just doing a 2 photon cut and nothing else
- This study will perform both tasks mentioned above and also see the effect from this study on data

### P Vs Theta; All Photons



#### Accepted Monte Carlo





### P Vs Theta; Thrown Photons

#### Entries 75310 Mean x $23.2 \pm 0.069$ Mean y $1.554 \pm 0.004502$ 50 Std Dev x $18.93 \pm 0.04879$ Std Dev y $1.236 \pm 0.003184$ 40 30 20 10 20 40 60 80 100 120 140 Theta

#### Accepted Monte Carlo





bggen

## P Vs Theta; Secondary Photons

#### Accepted Monte Carlo



#### bggen





### Phi Vs Theta; All Photons

#### Accepted Monte Carlo

bggen







### Phi Vs Theta; Thrown Photons

#### Accepted Monte Carlo

bggen







### Phi Vs Theta; Secondary Photons

#### Accepted Monte Carlo

bggen







### g1g2 Mass Vs Number of Photons in Event; All Photons Accepted Monte Carlo

Entries 58709 Mean x  $3.47 \pm 0.004923$ 0.9 Mean v  $0.4206 \pm 0.0007002$ Std Dev x  $1.192 \pm 0.003481$  $0.1696 \pm 0.0004951$ 0.8 Std Dev y 0.7  $10^{2}$ 0.6 0.5 0.4 10 0.3 0.2 0.1 0, 10 5 7 9 3 4 6 Num Photons





# g1g2 Mass Vs Number of Photons in Event; Thrown Photons







# g1g2 Mass Vs Number of Photons in Event; Secondary Photons







### g1g2 Mass with 2 Photons in Event; Thrown Photons







#### g1g2 Mass with more than 2 Photons in Event; Thrown Photons Accepted Monte Carlo ProjectionY of binx=[4,10] [x=3.0..10.0] ProjectionY of binx=[4,10] [x=3.0..10.0]







## P Vs Theta Distributions With Cut, **All Photons**

Accepted Monte Carlo

bggen







## Phi Vs Theta Distributions With Cut, All Photons

Accepted Monte Carlo

bggen





# g1g2 Mass Vs Number of Photons in Event; All Photons







### g1g2 Mass Vs Number of Photons in Event; Thrown Photons Accepted Monte Carlo





# g1g2 Mass Vs Number of Photons in Event; Secondary Photons

10

 $10^{-1}$ 





### g1g2 Mass with 2 Photons in Event; Thrown Photons







#### g1g2 Mass with more than 2 Photons in Event; Thrown Photons Accepted Monte Carlo ProjectionY of binx=[4,10] [x=3.0..10.0] ProjectionY of binx=[4,10] [x=3.0..10.0]







### Table of Results:

	2 Gamma Cut	P Vs Theta Cut + 2 Gamma Cut
Thrown	8,000/30,315 = 26 %	1383/30,315 = 5%
bggen	1,243	1,676
Data	3,143	3,489