Status of Sample Fraction Study

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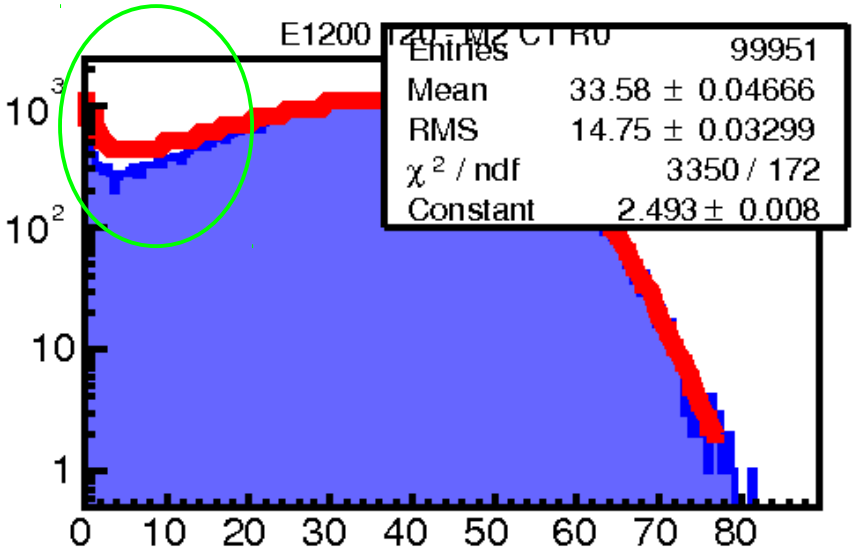
1. Update from the previous report (see Calorimetry meeting on September 25, 2012 for details)

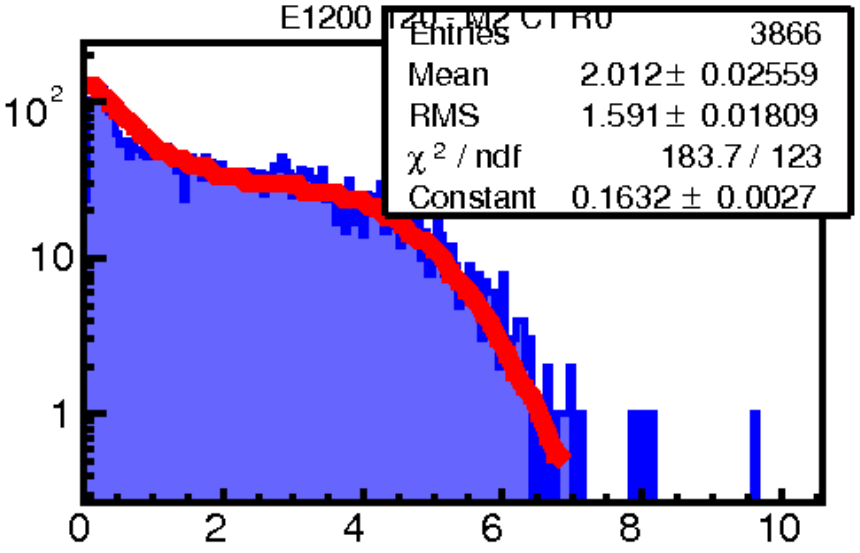
2. High sensitivity on thresholds (272 keV on Etot, and 30 keV on Efibers for every readout cell)

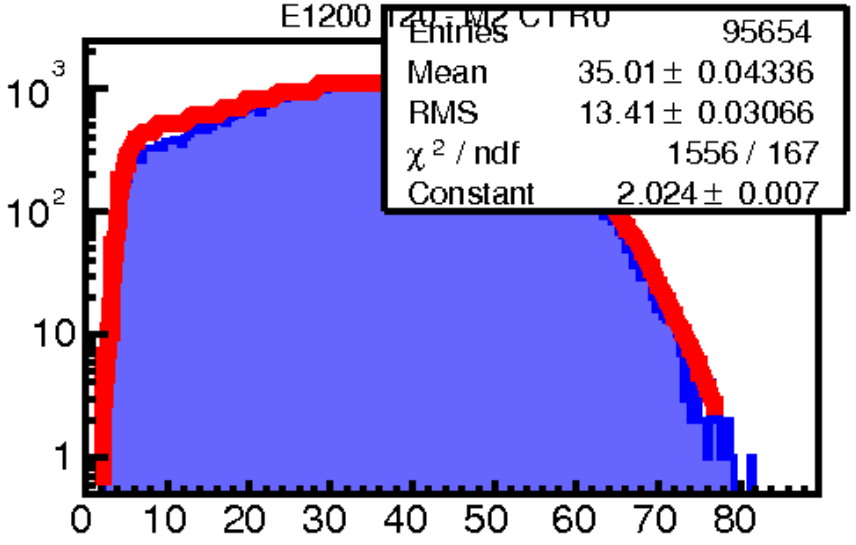
3. Stat-Term coefficient is fixed for whole module as “const/sqrt(10.*SamplFract)”

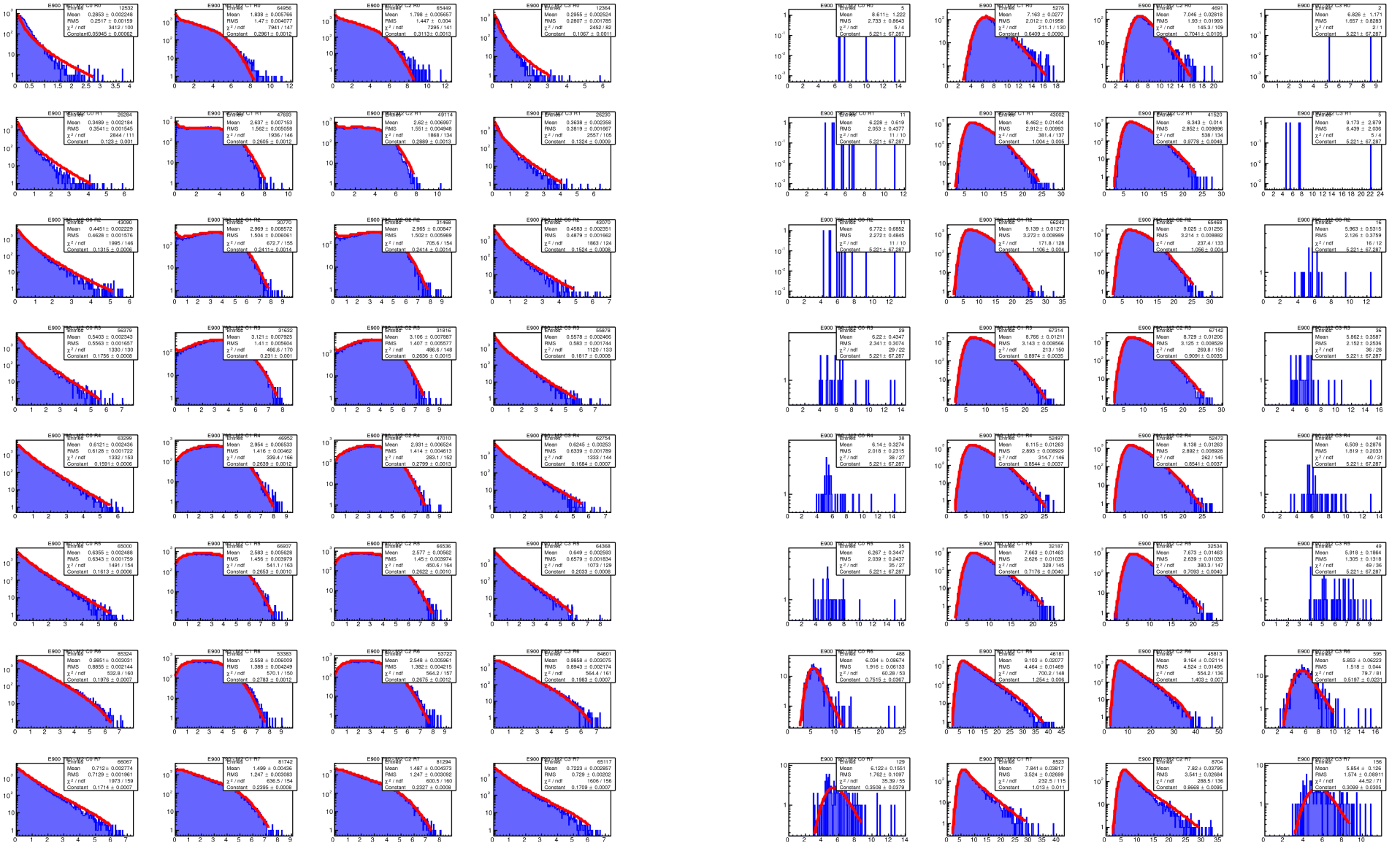
4. Poisson distribution (though it should be Binomial one). Cut on the tail.

5. Split of the statistics (see next slide)

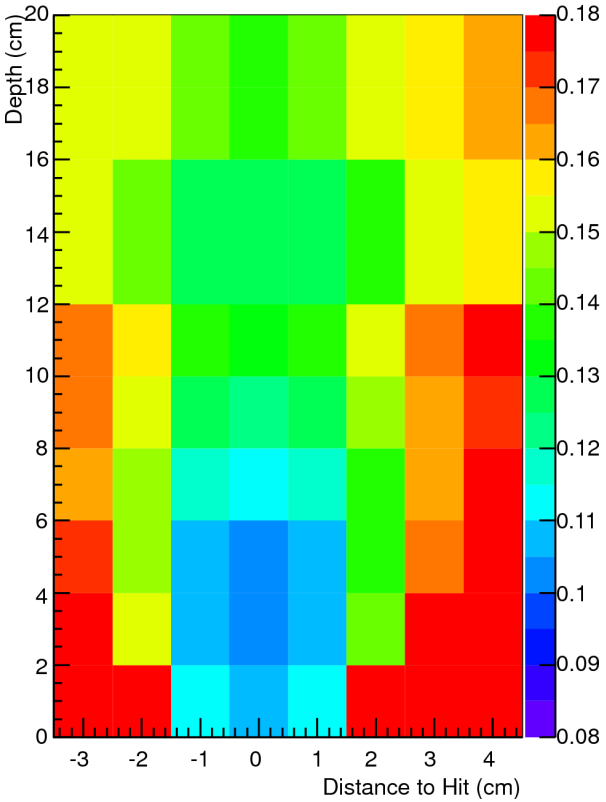

E1200
Entries 99951
Mean 33.58 ± 0.04666
RMS 14.75 ± 0.03299
χ² / ndf 3350 / 172
Constant 2.493 ± 0.008
10³
10²
10
1
0 10 20 30 40 50 60 70 80


E1200
Entries 3866
Mean 2.012 ± 0.02559
RMS 1.591 ± 0.01809
χ² / ndf 183.7 / 123
Constant 0.1632 ± 0.0027
10²
10
1
0 2 4 6 8 10

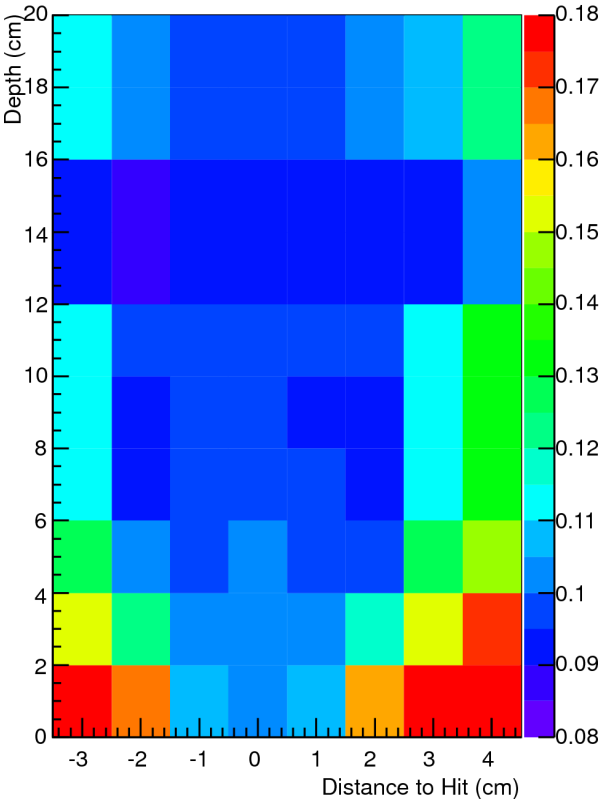

E1200
Entries 95654
Mean 35.01 ± 0.04336
RMS 13.41 ± 0.03066
χ² / ndf 1556 / 167
Constant 2.024 ± 0.007
10³
10²
10
1
0 10 20 30 40 50 60 70 80



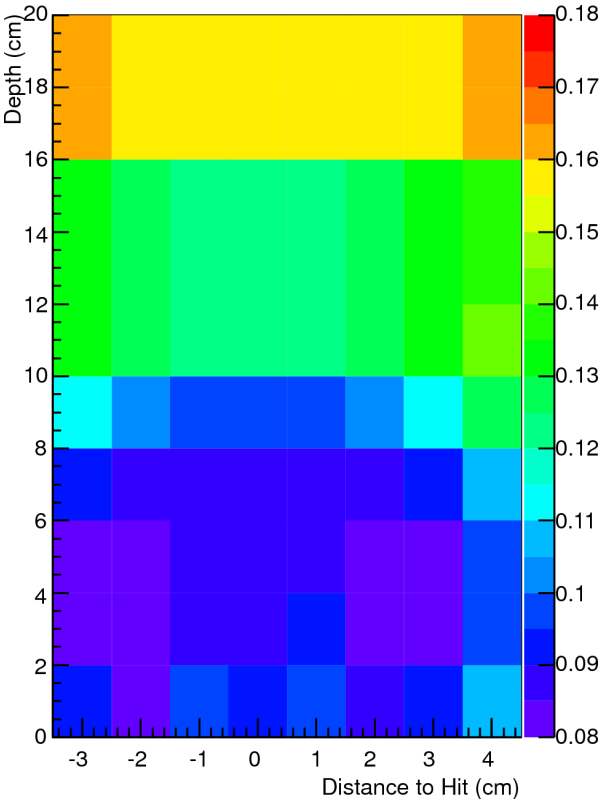
Sampl Fraction: E100 T80

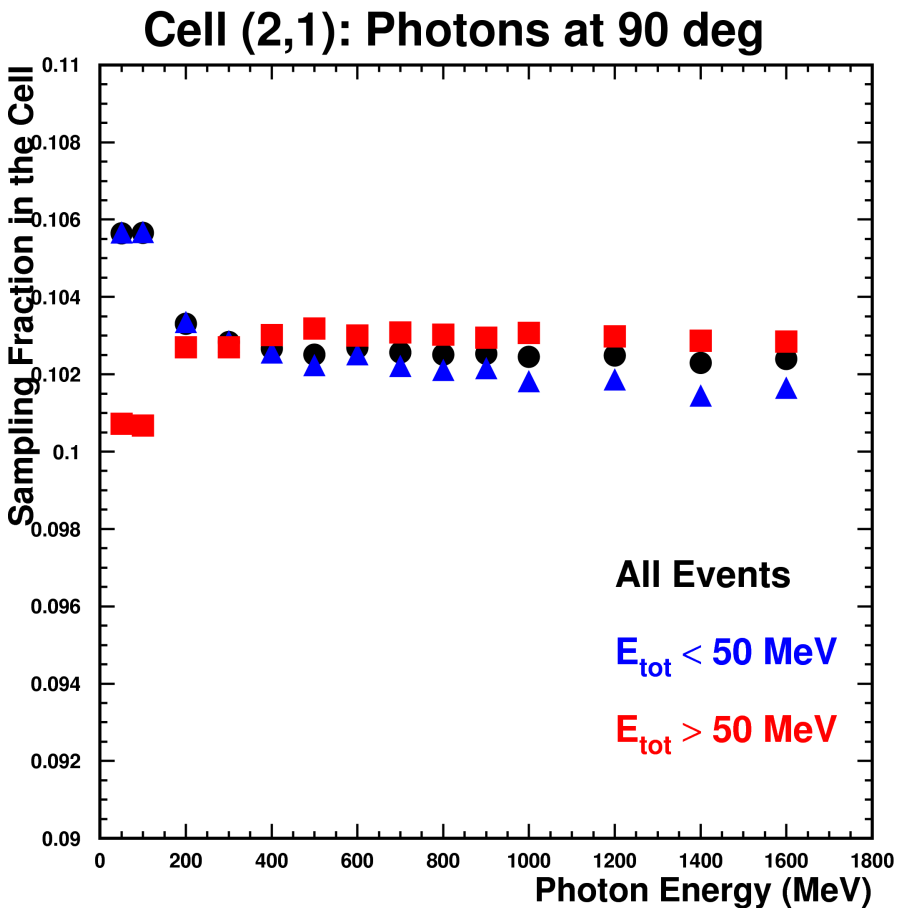


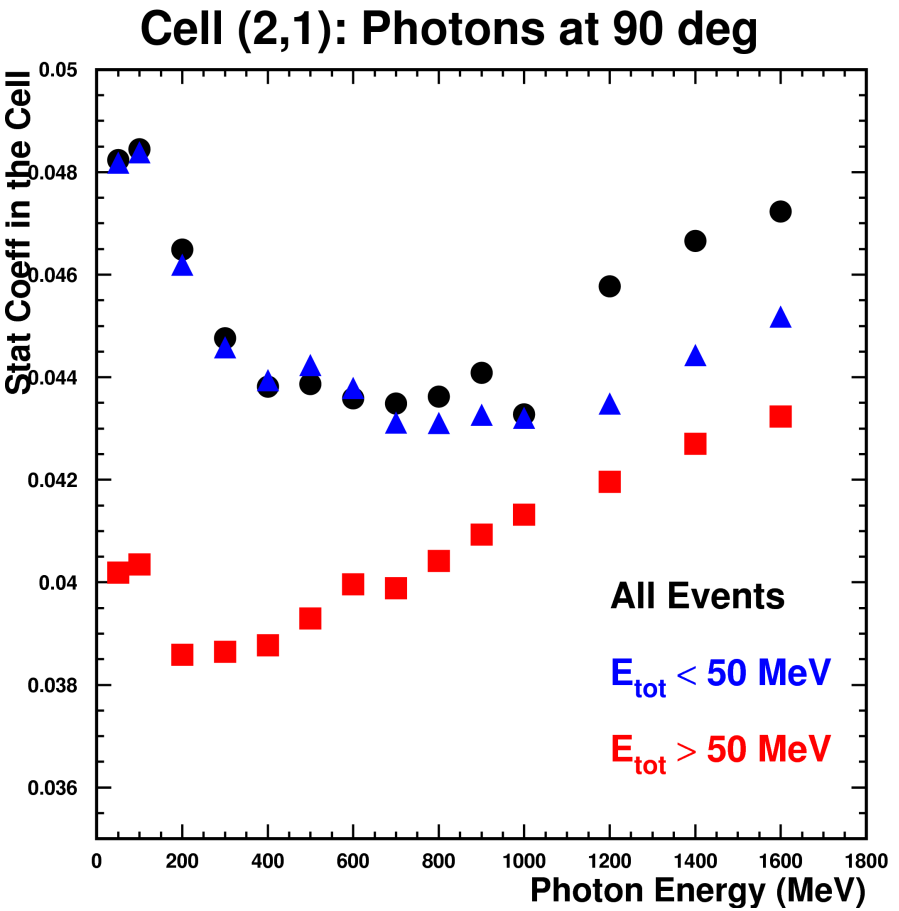
Sampl Fraction: E800 T80

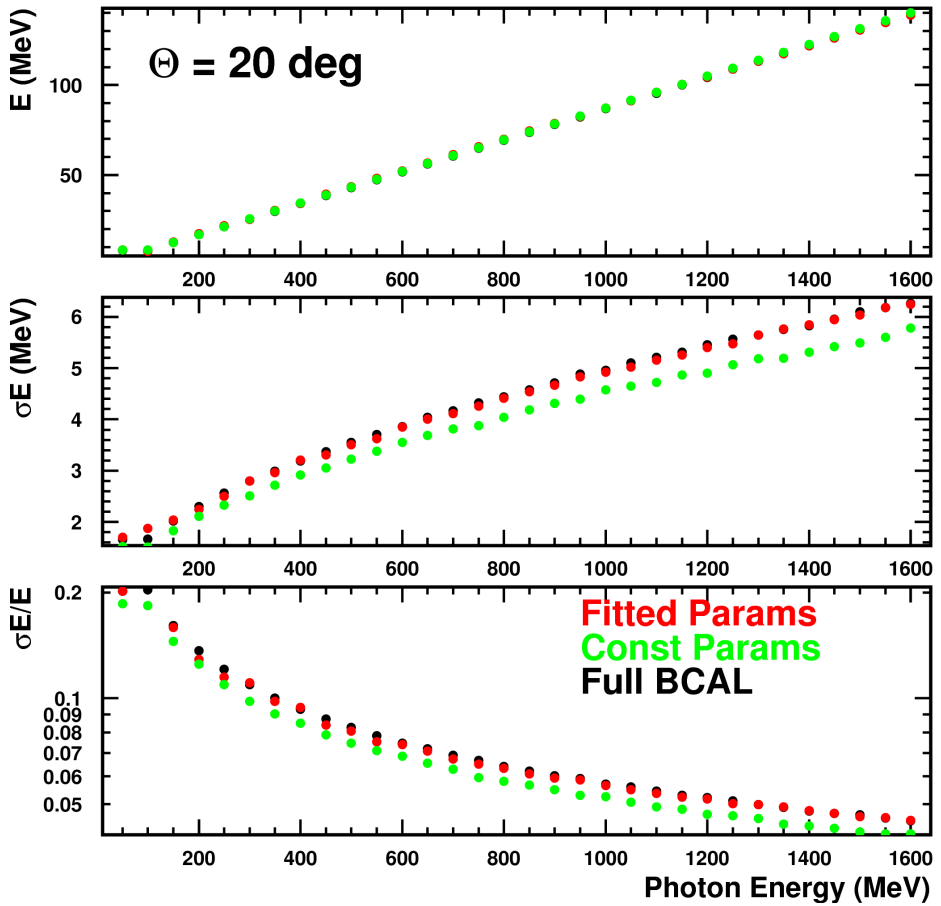


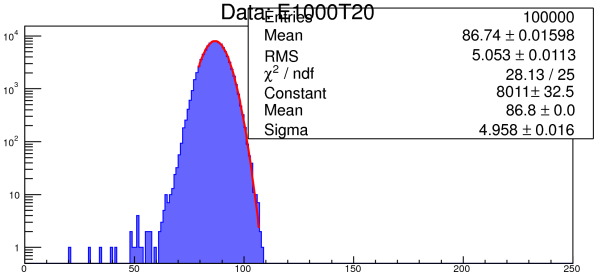
Sampl Fraction: E1200 T20

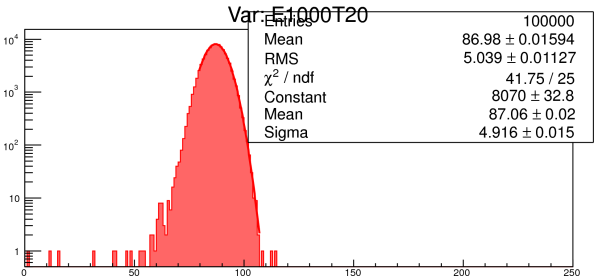


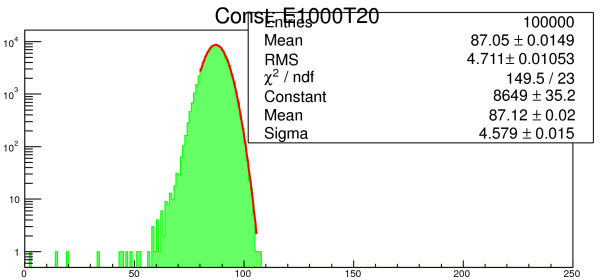

Cell (2,1): Photons at 90 deg
Sampling Fraction in the Cell
Photon Energy (MeV)
All Events
E_tot < 50 MeV
E_tot > 50 MeV

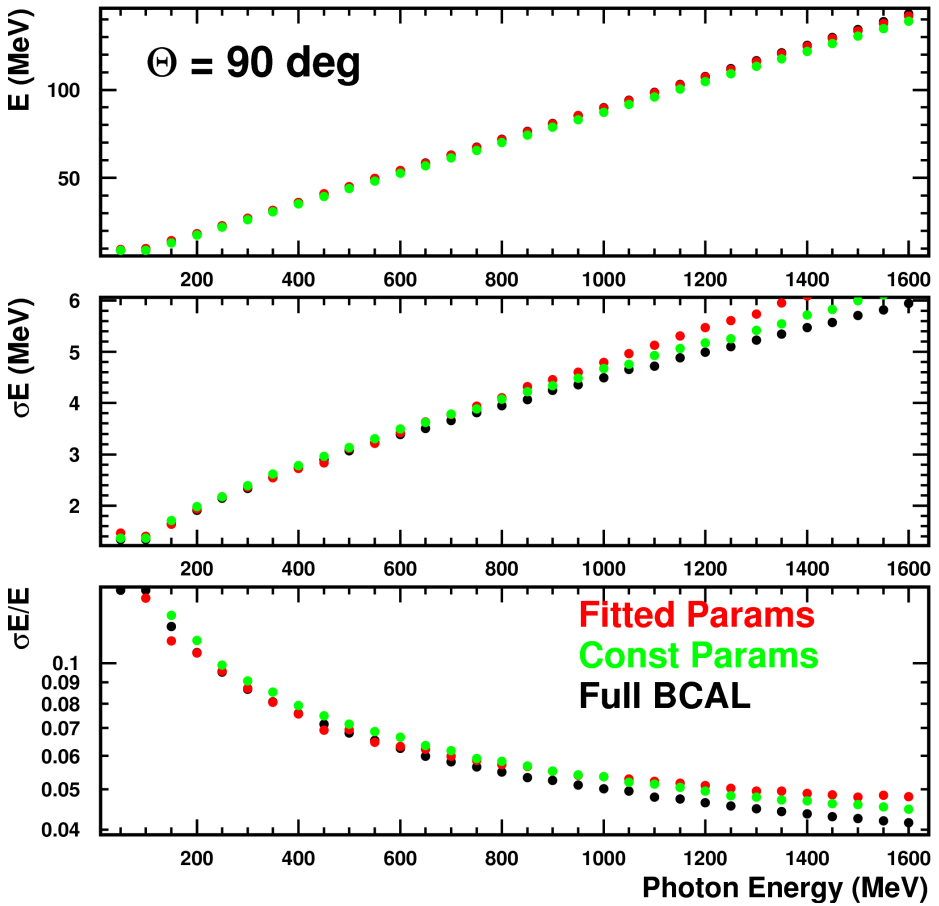

Cell (2,1): Photons at 90 deg
Stat Coeff in the Cell
Photon Energy (MeV)
All Events
E_tot < 50 MeV
E_tot > 50 MeV

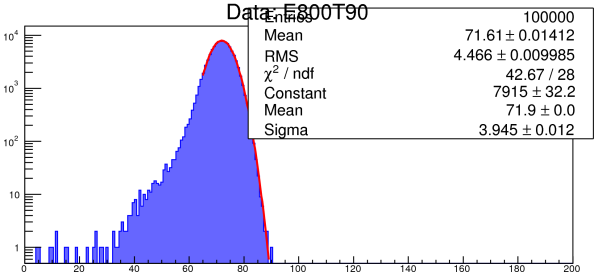

Θ = 20 deg
E (MeV)
σE (MeV)
σE/E
Fitted Params
Const Params
Full BCAL
Photon Energy (MeV)

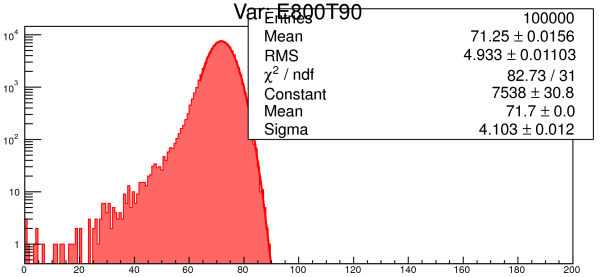

Data: E1000T20
Entries 100000
Mean 86.74 ± 0.01598
RMS 5.053 ± 0.0113
χ² / ndf 28.13 / 25
Constant 8011± 32.5
Mean 86.8 ± 0.0
Sigma 4.958 ± 0.016

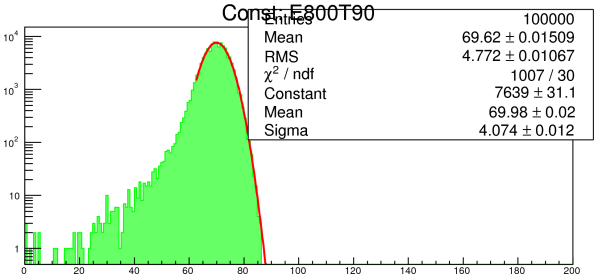

Var: E1000T20
Entries 100000
Mean 86.98 ± 0.01594
RMS 5.039 ± 0.01127
χ² / ndf 41.75 / 25
Constant 8070 ± 32.8
Mean 87.06 ± 0.02
Sigma 4.916 ± 0.015


Const: E1000T20
Entries 100000
Mean 87.05 ± 0.0149
RMS 4.711± 0.01053
χ² / ndf 149.5 / 23
Constant 8649 ± 35.2
Mean 87.12 ± 0.02
Sigma 4.579 ± 0.015

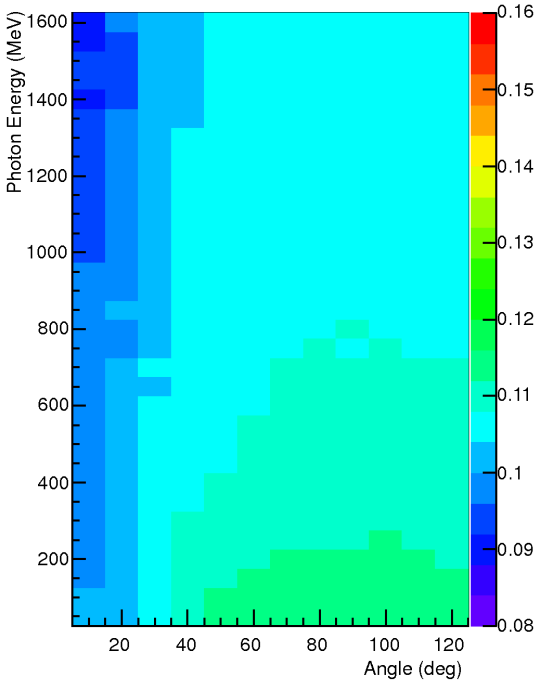

Θ = 90 deg
E (MeV)
σE (MeV)
σE/E
Fitted Params
Const Params
Full BCAL
Photon Energy (MeV)


Data: E800T90
Entries 100000
Mean 71.61 ± 0.01412
RMS 4.466 ± 0.009985
χ² / ndf 42.67 / 28
Constant 7915 ± 32.2
Mean 71.9 ± 0.0
Sigma 3.945 ± 0.012

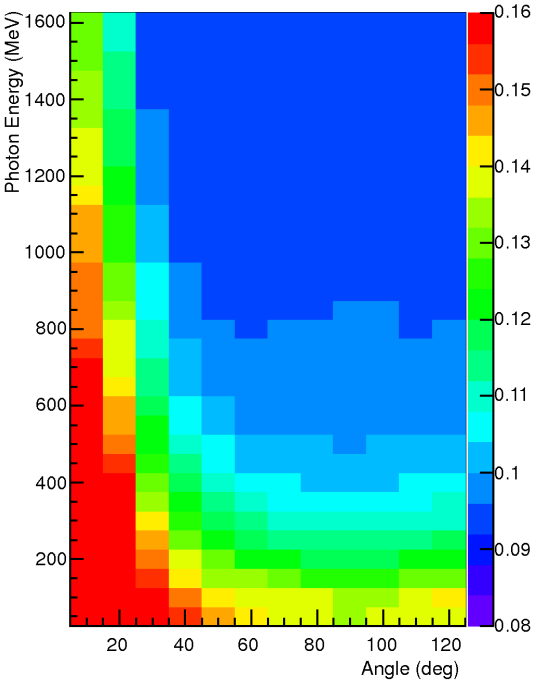

Var: E800T90
Entries 100000
Mean 71.25 ± 0.0156
RMS 4.933 ± 0.01103
χ² / ndf 82.73 / 31
Constant 7538 ± 30.8
Mean 71.7 ± 0.0
Sigma 4.103 ± 0.012


Const: E800T90
Entries 100000
Mean 69.62 ± 0.01509
RMS 4.772 ± 0.01067
χ² / ndf 1007 / 30
Constant 7639 ± 31.1
Mean 69.98 ± 0.02
Sigma 4.074 ± 0.012

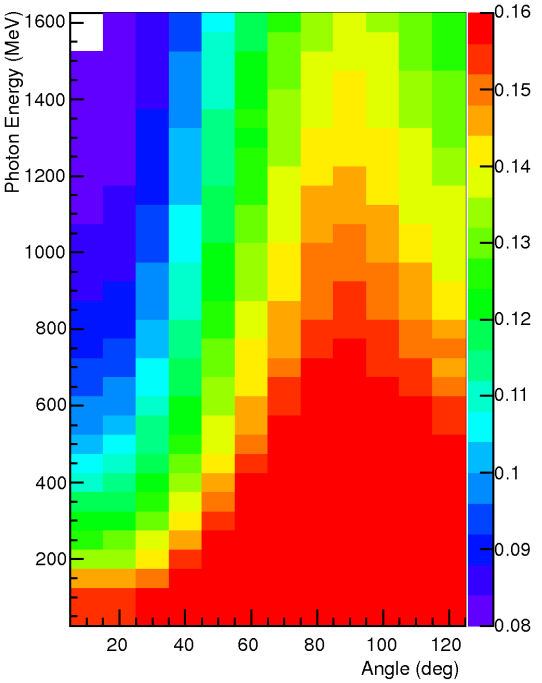
Sampl Frac: Col=2 Row=1 E<50MeV



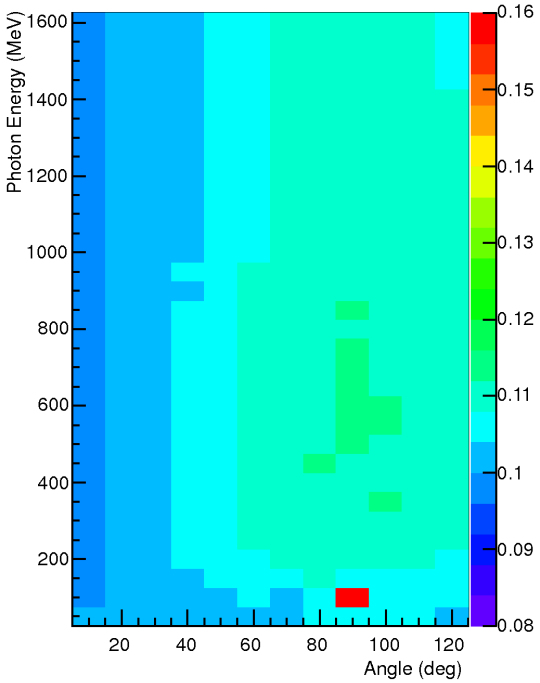
Sampl Frac: Col=2 Row=6 E<50MeV



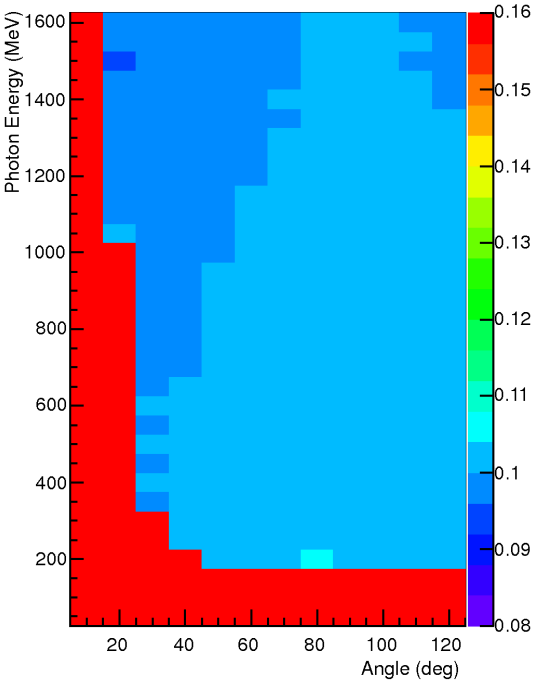
Sampl Frac: Col=1 Row=2 E<50MeV



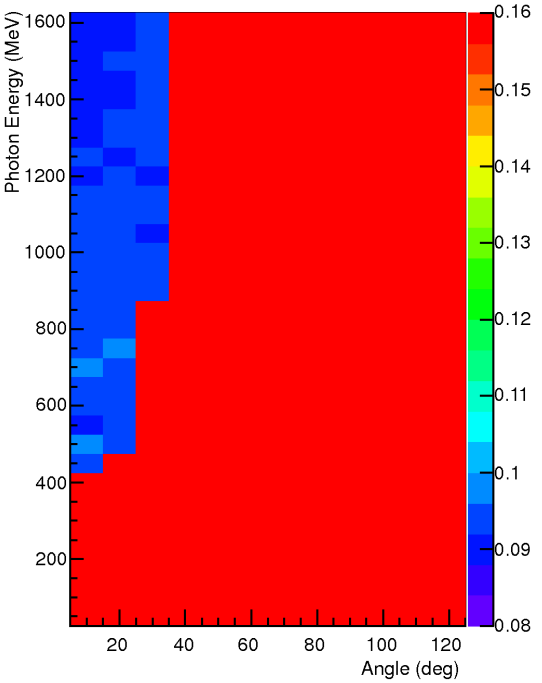
Sampl Frac: Col=2 Row=1 E>50MeV

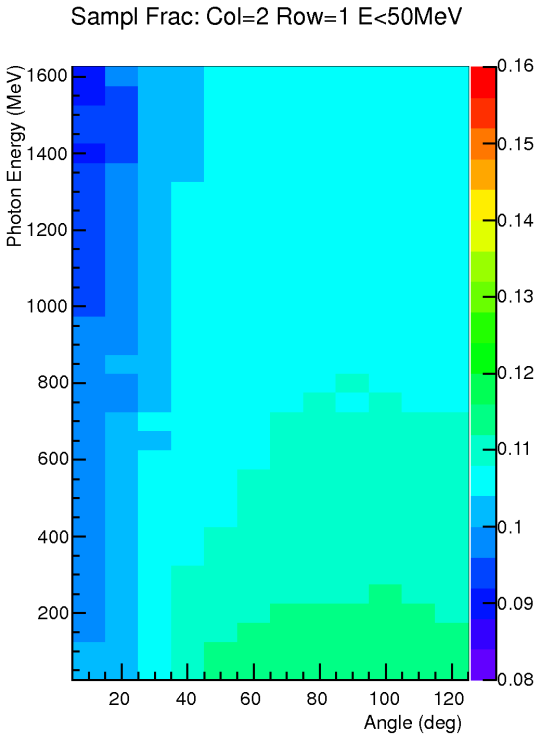


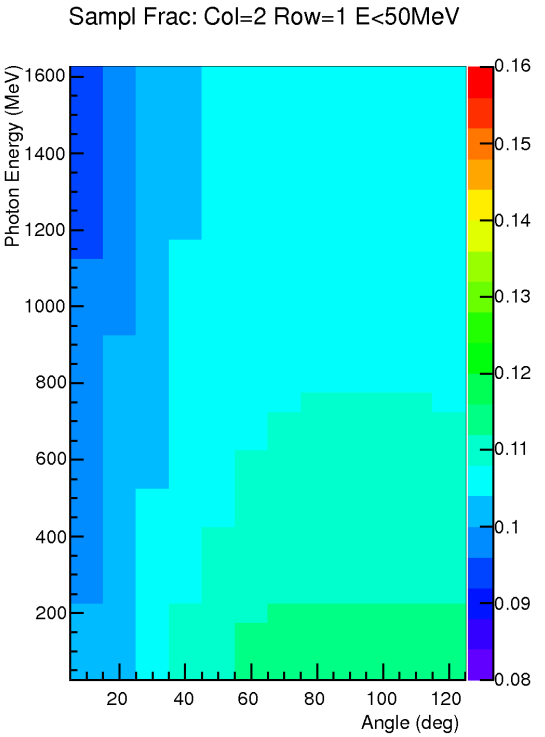
Sampl Frac: Col=2 Row=6 E>50MeV



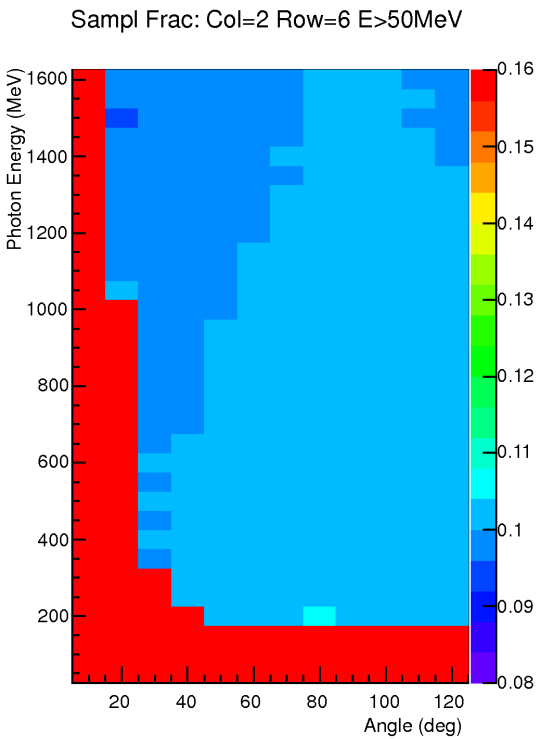
Sampl Frac: Col=1 Row=2 E>50MeV

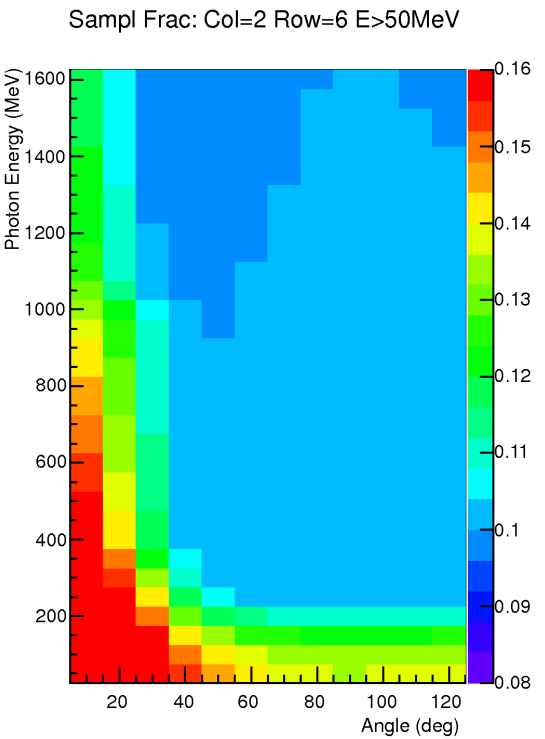


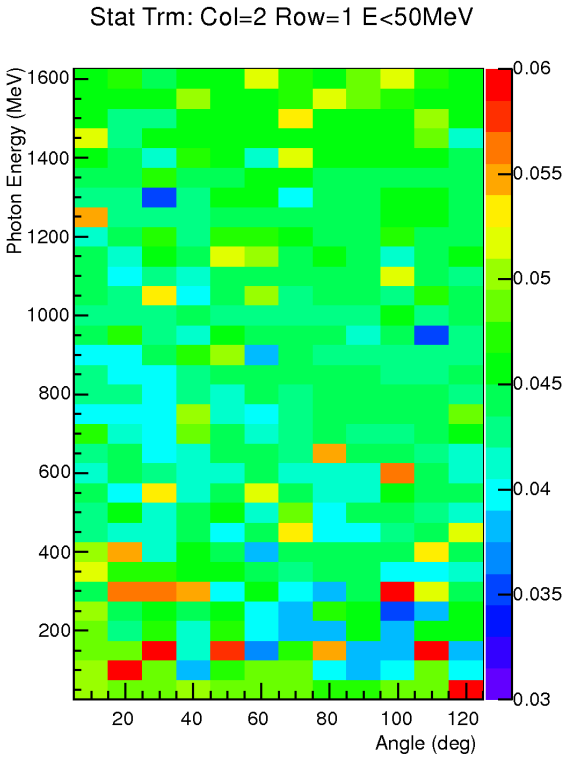

Sampl Frac: Col=2 Row=1 E<50MeV
Photon Energy (MeV)
1600
1400
1200
1000
800
600
400
200
20
40
60
80
100
120
Angle (deg)
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08

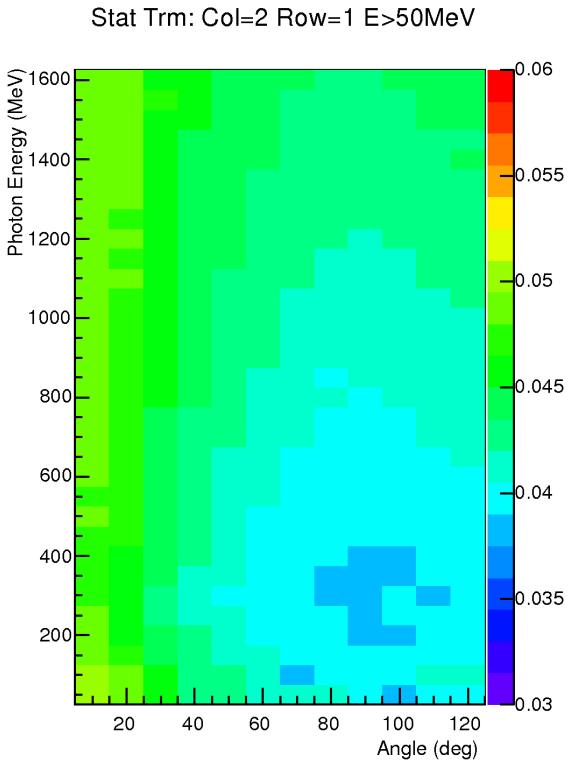

Sampl Frac: Col=2 Row=1 E<50MeV
Photon Energy (MeV)
1600
1400
1200
1000
800
600
400
200
20
40
60
80
100
120
Angle (deg)
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08

Smooth

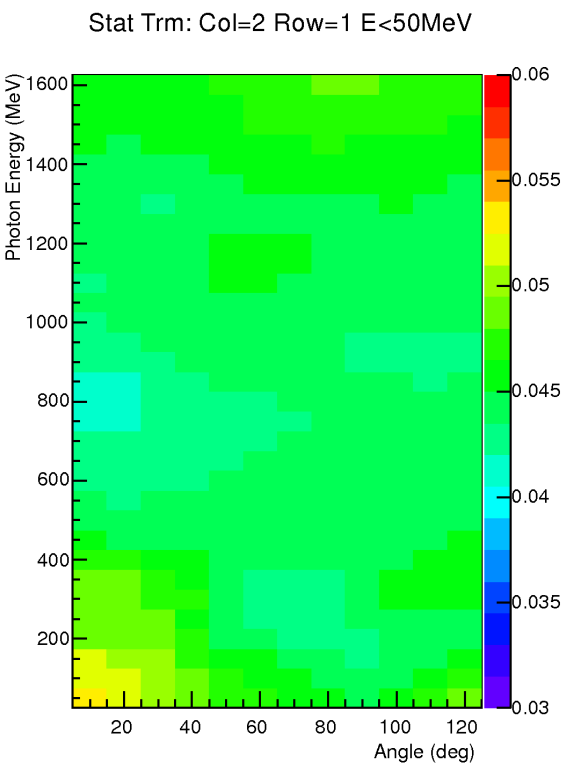

Sampl Frac: Col=2 Row=6 E>50MeV
Photon Energy (MeV)
1600
1400
1200
1000
800
600
400
200
20
40
60
80
100
120
Angle (deg)
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08

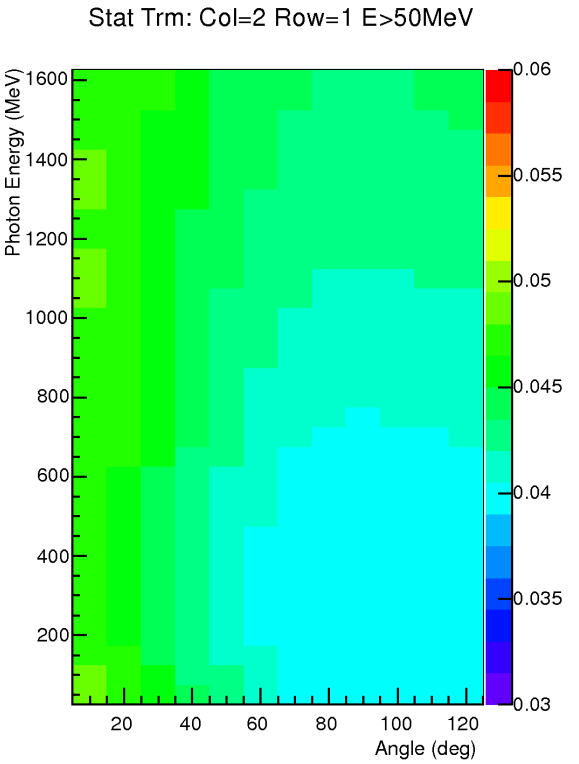

Sampl Frac: Col=2 Row=6 E>50MeV
Photon Energy (MeV)
1600
1400
1200
1000
800
600
400
200
20
40
60
80
100
120
Angle (deg)
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08


Stat Trm: Col=2 Row=1 E<50MeV
Photon Energy (MeV)
Angle (deg)


Stat Trm: Col=2 Row=1 E>50MeV
Photon Energy (MeV)
Angle (deg)

Smooth


Stat Trm: Col=2 Row=1 E<50MeV
Photon Energy (MeV)
Angle (deg)


Stat Trm: Col=2 Row=1 E>50MeV
Photon Energy (MeV)
Angle (deg)