

MOLLER simulation: Collimator Power

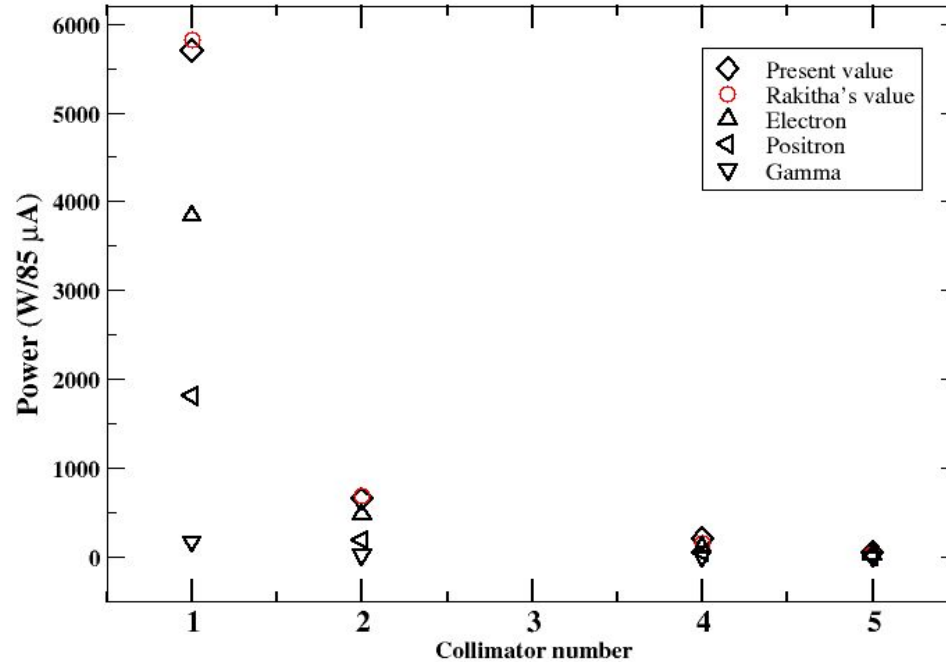
Chandan Ghosh

Jan 31, 2019

Power deposited inside collimators

	Power calculated by Chandan (Rakitha) (W/85 uA)			
Collimator	Total	e-	e+	Gamma
1	5694.7 (5820.5)	3768.9 (3836.4)	1788.2 (1811.3)	137.6 (170.6)
2	655.6 (691.8)	454.6 (476.2)	183.4 (191.2)	18.7 (23.7)
4	209.0 (163.2)	144.7 (110.4)	58.8 (47.6)	5.5 (5.2)
5	51.4 (31.8)	34.0 (20.9)	16.2 (9.9)	1.2 (1.0)

Power deposited inside collimators



Simulation details for next few slides

Remoll:develop (#da9c8a35)

```
/remoll/setgeofile geometry/mollerMother_merged.gdml  
/run/initialize  
/remoll/addfield map_directory/blockyHybrid_rm_3.0.txt  
/remoll/addfield map_directory/blockyUpstream_rm_1.1.txt  
/remoll/oldras true  
/remoll/rasx 5 mm  
/remoll/rasy 5 mm  
/remoll/evgen/set beam  
/remoll/beamene 11 GeV  
/remoll/kryptonite/set false  
/process/list  
/run/beamOn 500000
```

Power deposited inside collimators with 1 mm collimator 1 & 2 offset; other things are at place

	Power calculated (W/85 uA) (value from different run)			
Collimator	Total	e-	e+	Gamma
1	5815.2 (5709.4)	3847.2 (3778.8)	1827.6 (1792.7)	140.4 (137.9)
2	684.7 (640.8)	474.1 (444.6)	191.2 (177.9)	19.4 (18.3)
4	207.9 (207.4)	144.4 (143.8)	58.1 (58.1)	5.4 (5.5)
5	52.4 (36.1)	34.6 (24.0)	16.5 (11.2)	1.3 (0.9)

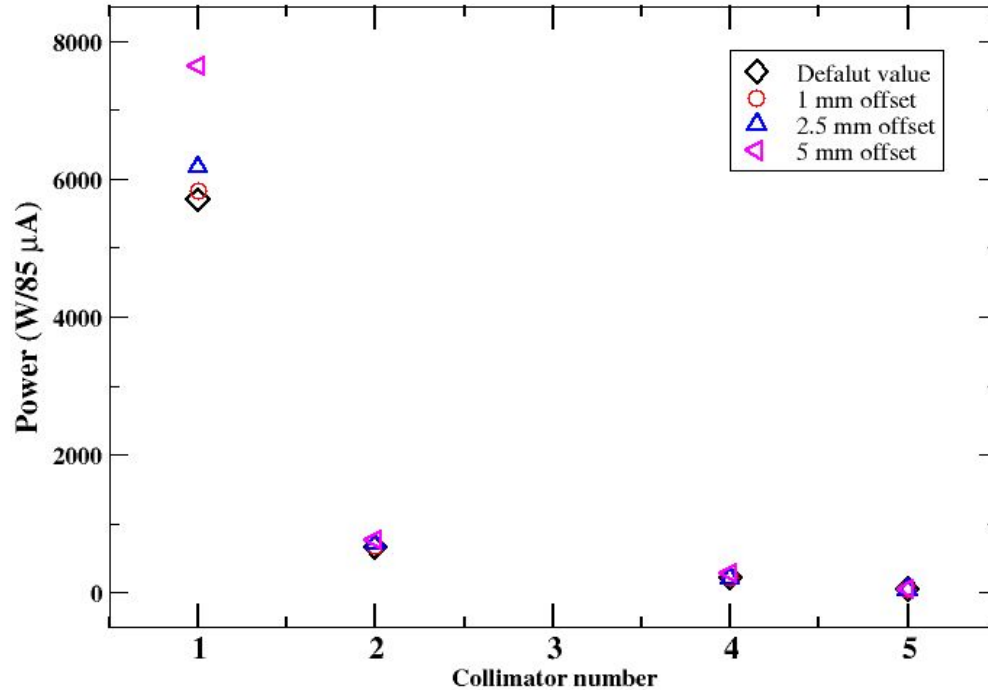
Power deposited inside collimators with **2.5 mm collimator 1 & 2 offset**; other things are at place

	Power calculated (W/85 uA) (value from different run)			
Collimator	Total	e-	e+	Gamma
1	6166.7 (6297.2)	4080.1 (4167.2)	1937.7 (1977.7)	148.9 (152.3)
2	710.4 (684.7)	492.1 (475.4)	198.1 (189.7)	20.2 (19.6)
4	216.4 (209.1)	149.4 (144.6)	61.3 (59.1)	5.7 (5.4)
5	49.6 (45.6)	32.8 (30.3)	15.5 (14.2)	1.2 (1.1)

Power deposited inside collimators with 5 mm collimator 1 & 2 offset; other things are at place

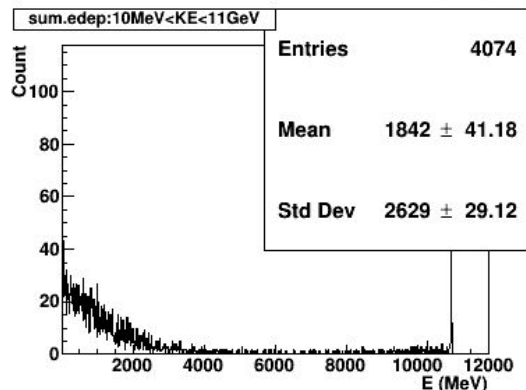
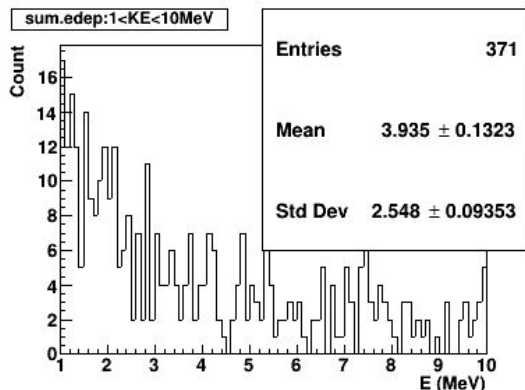
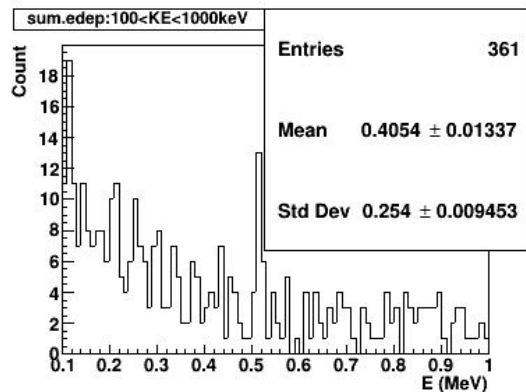
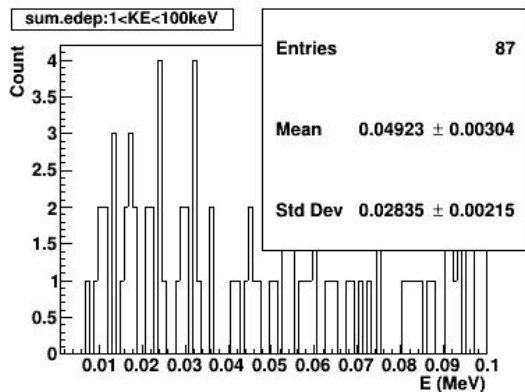
	Power calculated (W/85 uA) (value from different run)			
Collimator	Total	e-	e+	Gamma
1	7630.2 (7584.0)	5047.2 (5014.3)	2398.4 (2386.3)	184.6 (183.4)
2	765.4 (680.7)	532.9 (476.4)	210.2 (184.2)	22.3 (20.1)
4	280.6 (273.2)	192.8 (187.4)	80.5 (78.7)	7.3 (7.1)
5	44.6 (73.6)	29.6 (48.7)	13.9 (23.1)	1.1 (1.8)

Power deposited inside collimators with collimator 1 & 2 position offsets



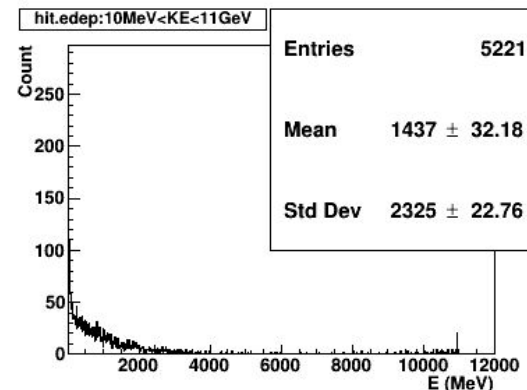
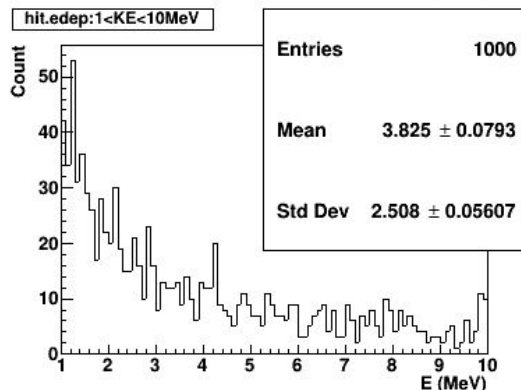
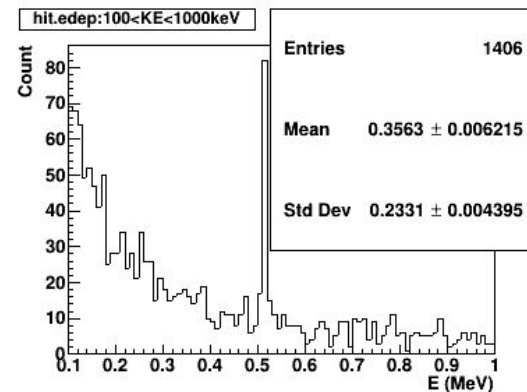
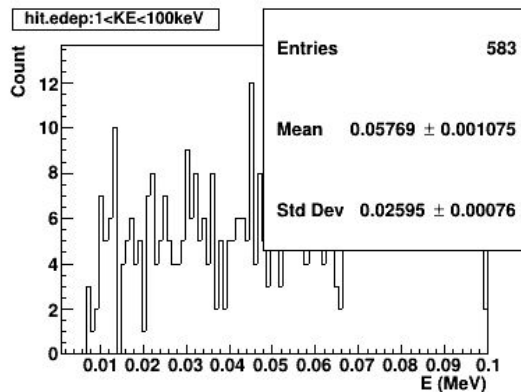
Kryptonite test

With Kryptonite TRUE : Collimator 1 power deposition from sum.edep

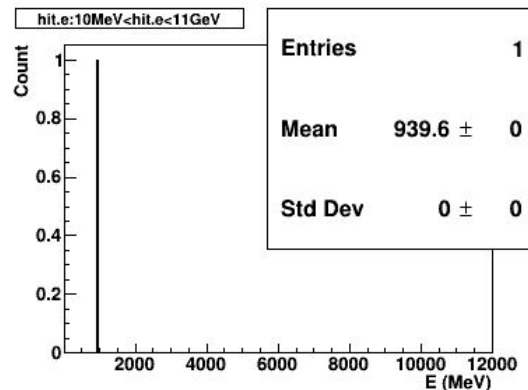
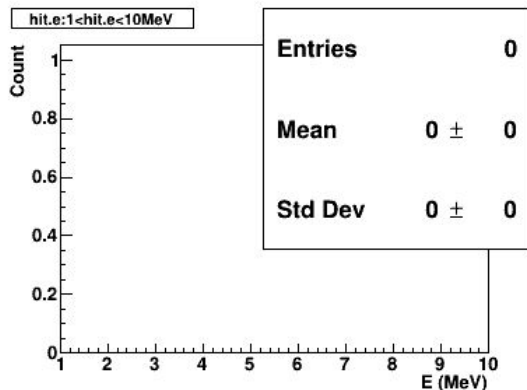
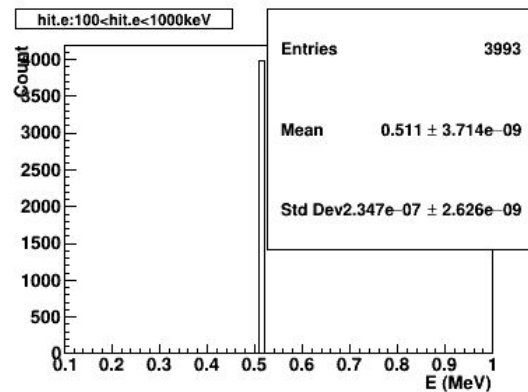
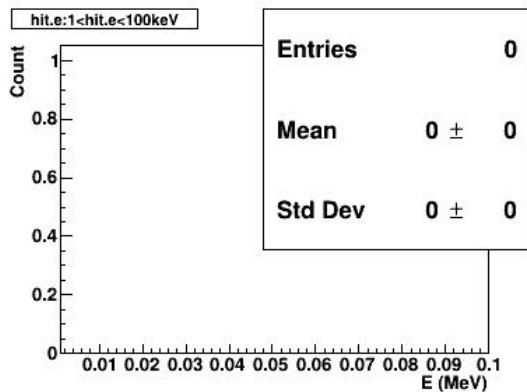


With Kryptonite TRUE : Collimator 1 power deposition from hit.edep

- Total energy deposition from sum.edep = $7.50675e+06$ MeV (for 100K electrons on target)
- Total energy deposition from hit.edep = $7.50675e+06$ MeV (for 100K electrons on target)

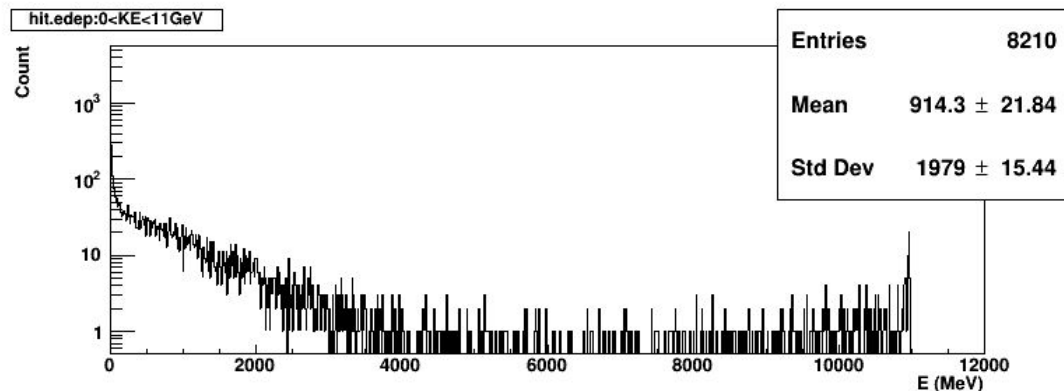
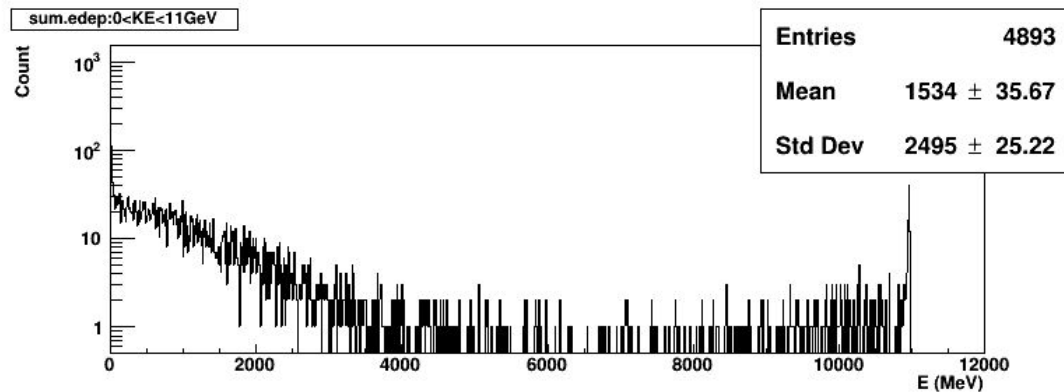


hit.e on collimator 1 with Kryptonite TRUE

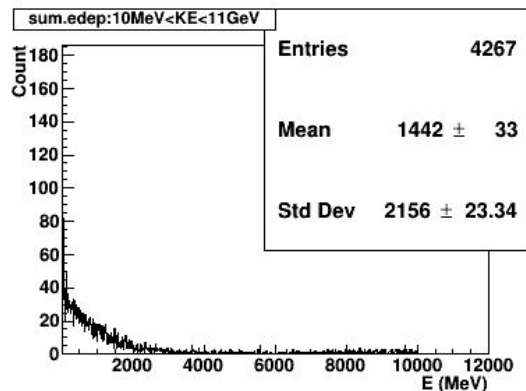
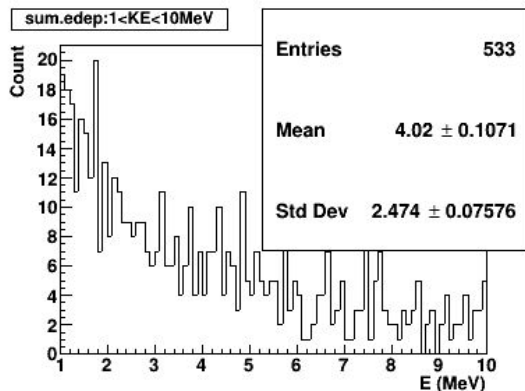
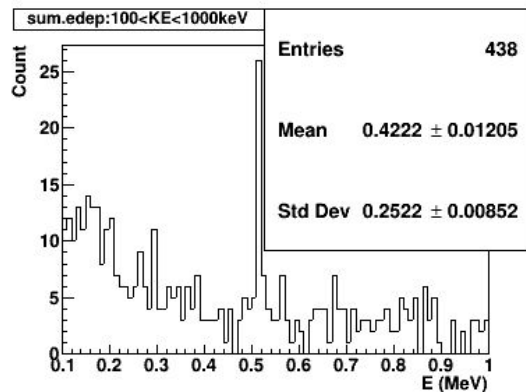
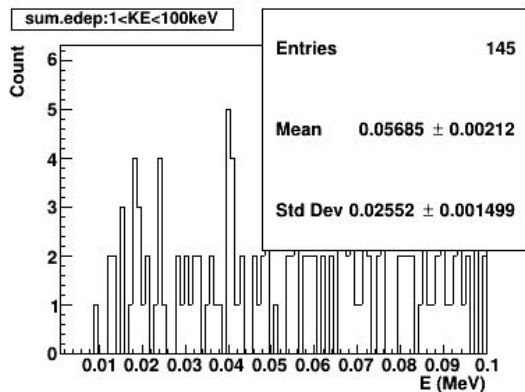


Comparison of sum.edep and hit.edep with Kryptonite TRUE without energy cut

- ❖ There is no energy cut, only volume cut on collimator 1 (det 2001)
- ❖ The entries are just sum of four entries in slides 10 and 11!! (I have verified this by directly plotting the same quantity from root file)

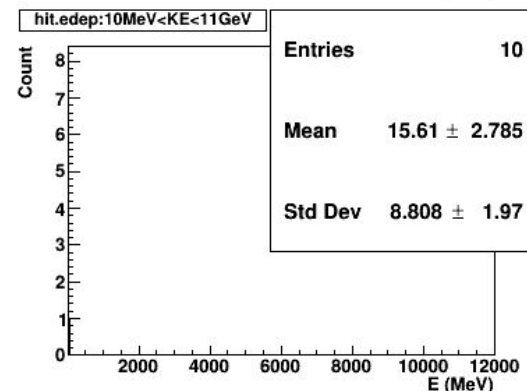
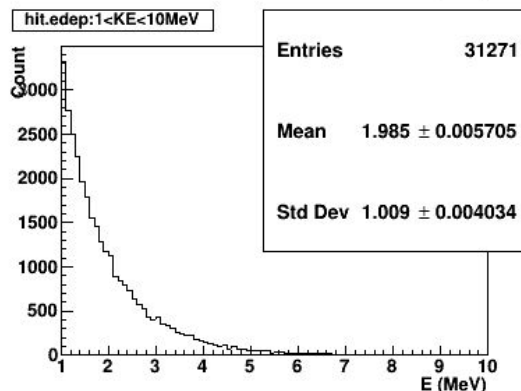
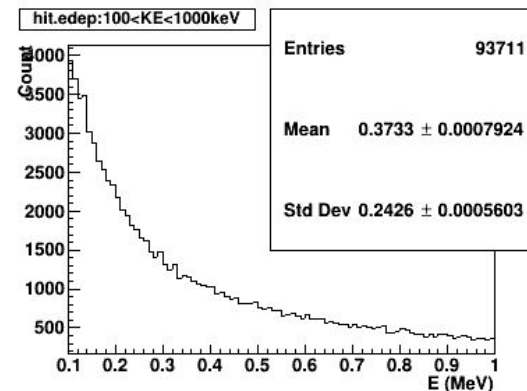
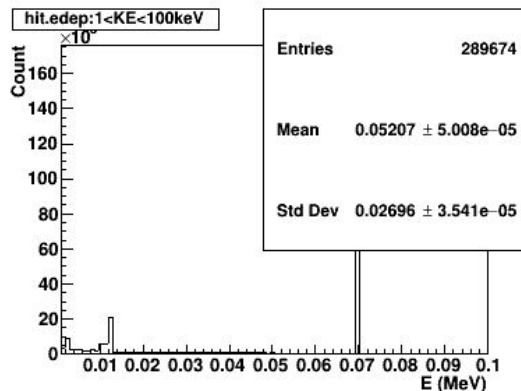


With Kryptonite FALSE : Collimator 1 power deposition from sum.edep

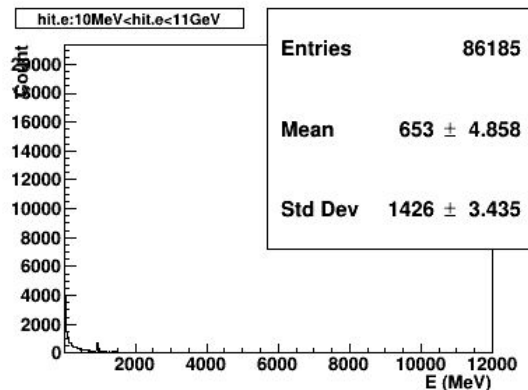
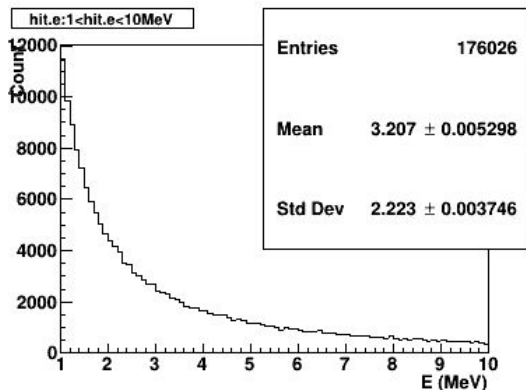
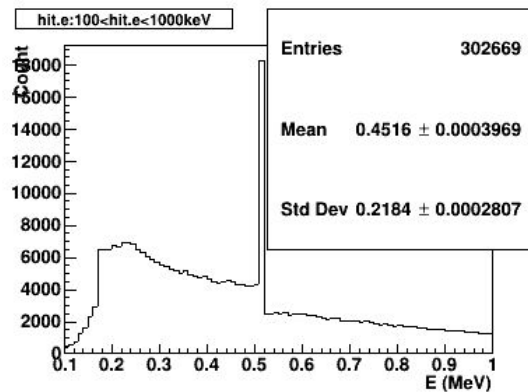
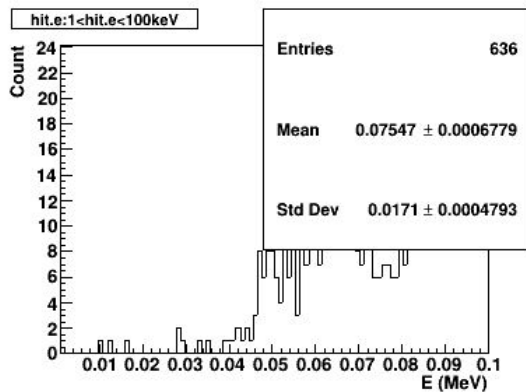


With Kryptonite FALSE : Collimator 1 power deposition from hit.edep

- Total energy deposition from sum.edep = $6.15504e+06$ MeV (for 100K electrons on target)
- Total energy deposition from hit.edep = 112280 MeV (for 100K electrons on target)



hit.e on collimator 1 with Kryptonite FALSE



Comparison of sum.edep and hit.edep with Kryptonite FALSE and without energy cut

