Gem detector simulation

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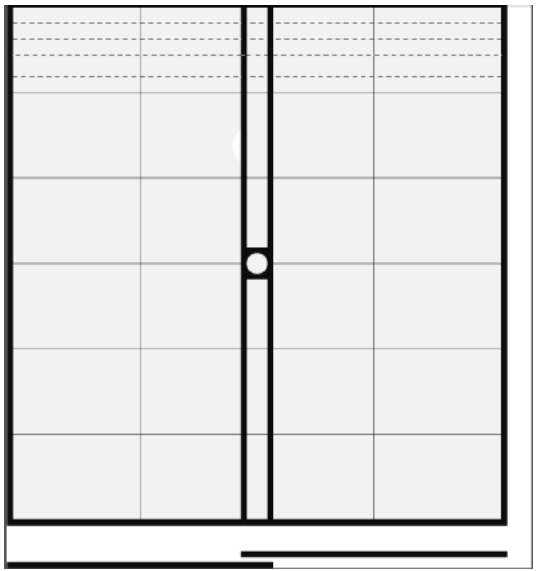
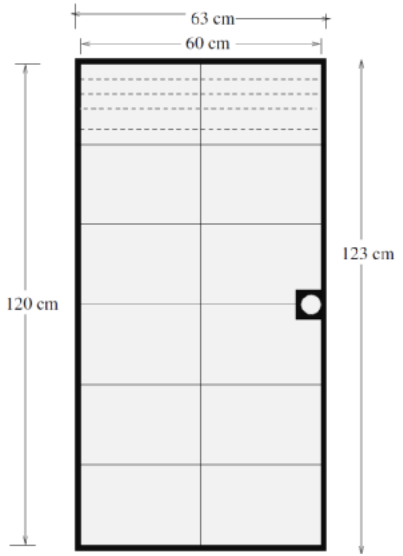
Sketch of overlapping GEMs



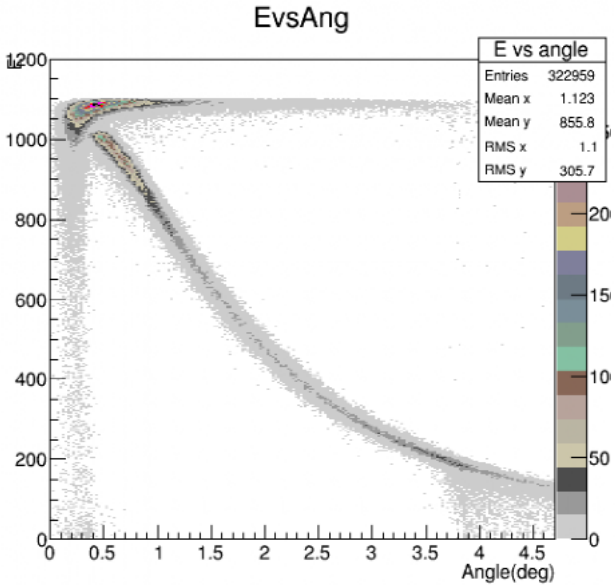


Material: G10, Kapton foils, copper, Ar, CO2 ~~0.5% radiation length

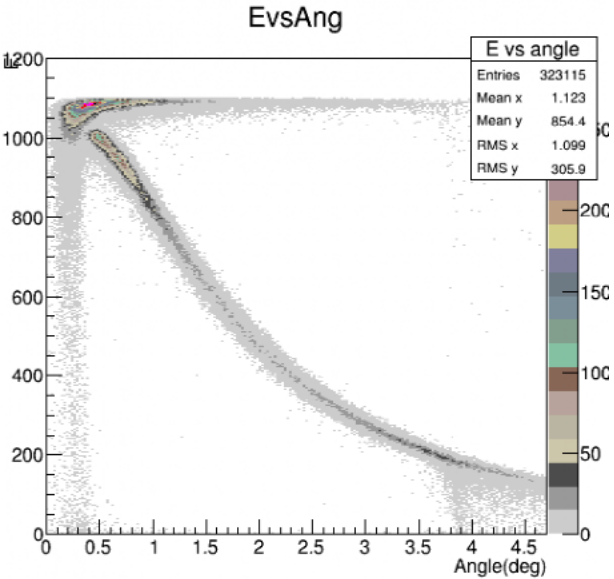
G10 Frame : 1.5cm ~~7.5% radiation length

Distance from Hycal surface : 17cm

Energy VS Angle plots

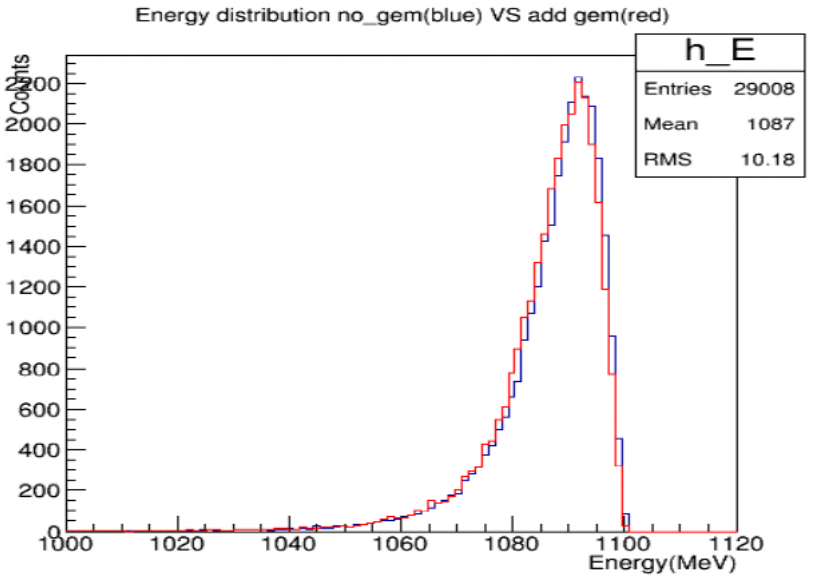


Plot for no gem
Without any cut



Plot for add gem
Without any cut

Energy Distribution for ep events



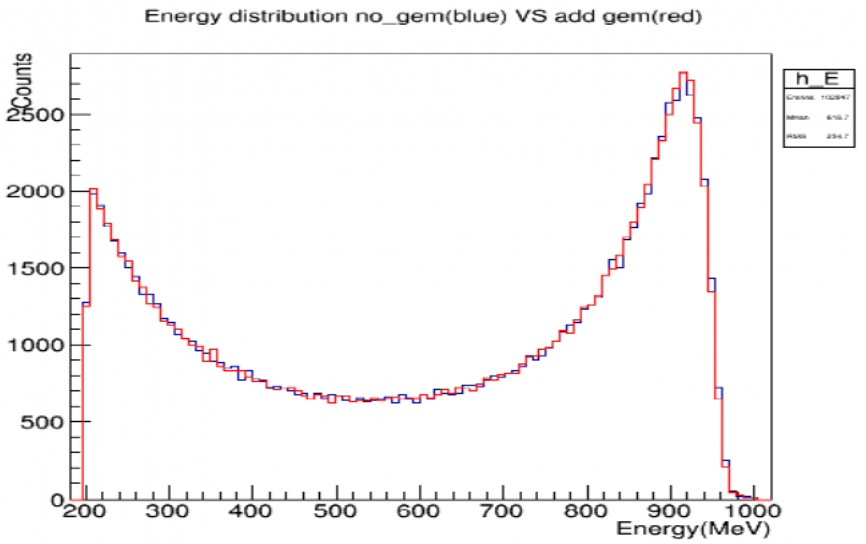
For ep events(apply cut E>1000MeV & Angle >0.7deg)

no gem case: 29008 counts

Add gem case: 29093 counts

Difference ~~ (N_gem - N_nogem)/N_nogem = 0.293%

Energy Distribution for moller events



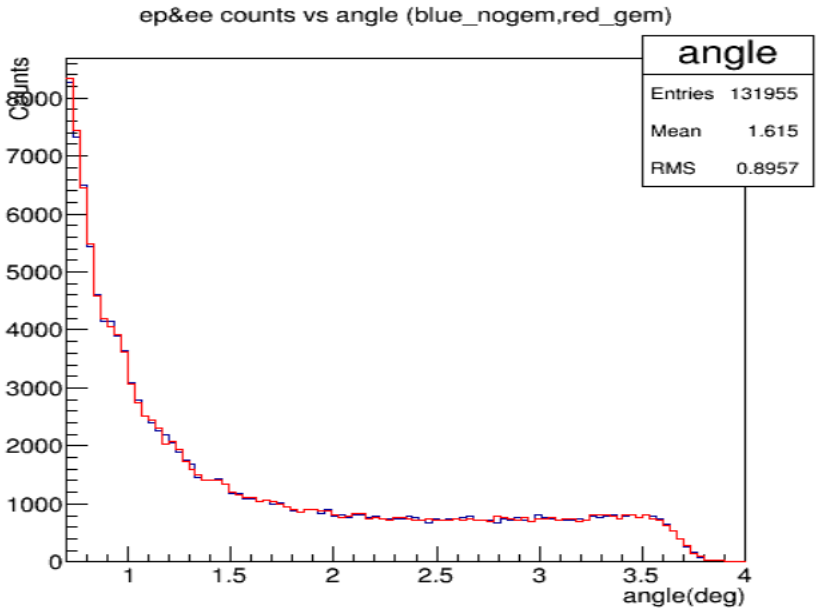
For moller events(apply cut E>200MeV & Angle >0.7deg)

no gem case: 102947 counts

Add gem case: 102879 counts

Difference ~~ (N_gem - N_nogem)/N_nogem = -0.066%

Ep and moller event counts vs angle plot



The plot shows that after passing gem, the effect of angle is small

Conclusion

Page 4 and 5 Shows that after adding the gem detector, will cause a few MeV energy lose for all events.

There will be 85 ep events (0.293% ep events) losing certain energy and drop to moller range.

The effect on angle is small.(we will use gem to get the angle information, so this is not important)