

He4 Bag Simulation

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Prad

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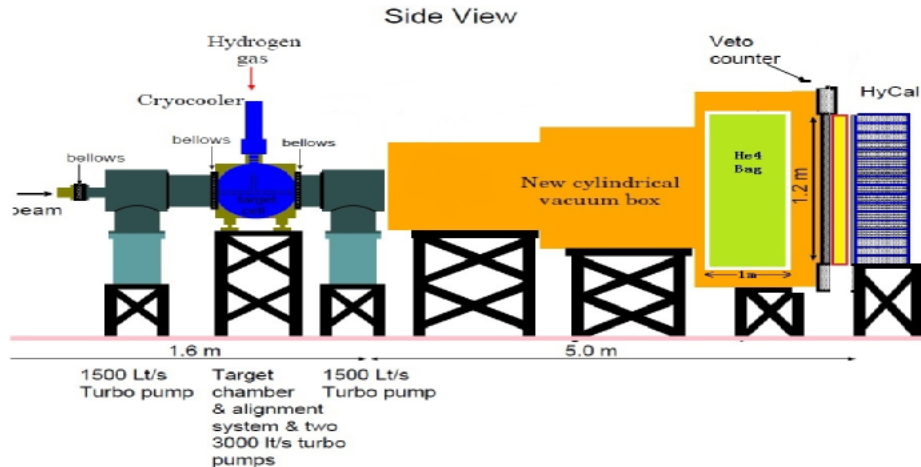
Adding a He4 gas Bag

Materials:

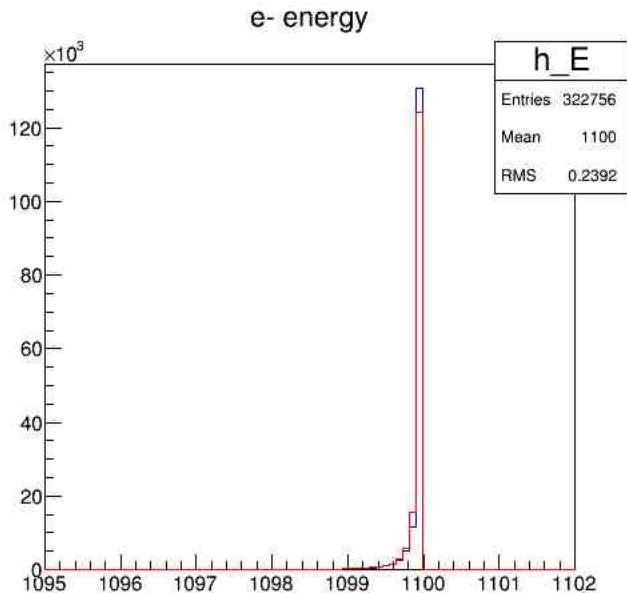
He4 gas --- 1 meter

Mylar window --- 100um

Total 0.05% radiation length



Compare the full angle ep data with and without He4 bag



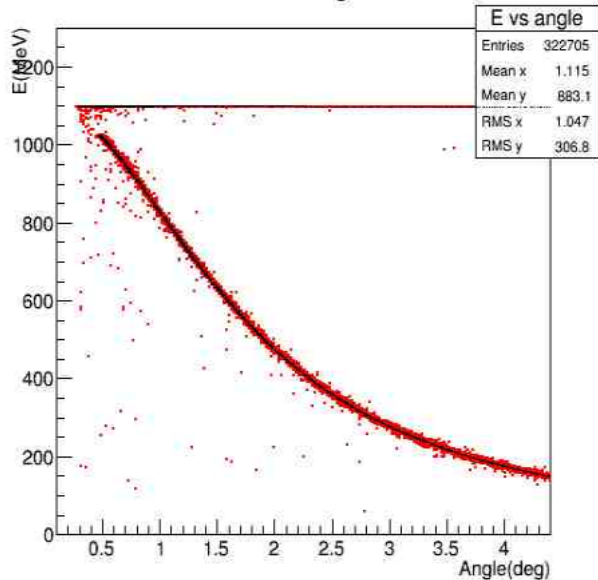
ep events

Black : without He4 Bag
156436 events

Red: with He4 Bag
156354 events

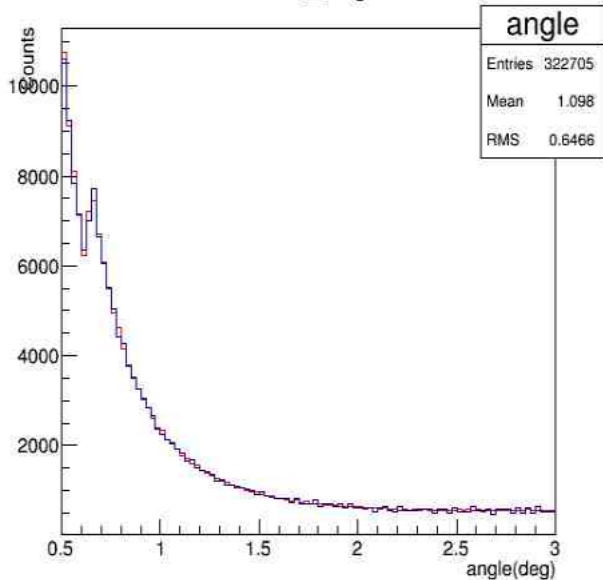
$\triangle \sim (156436-156354)/156436$
 $= 0.052\%$

EvsAng



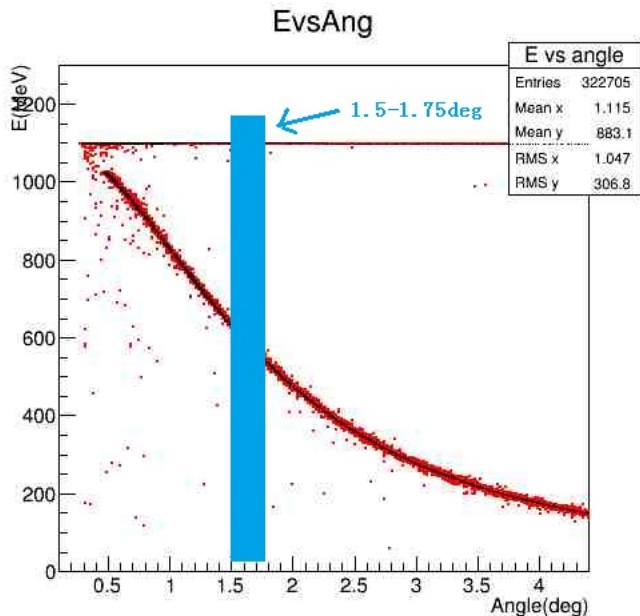
Energy vs angle plot for
red : add He4 Bag
Black: no He4 Bag

events_angle



Events vs angle plot

Check 1.50-1.57deg angle bin ep and ee events



For ep :

He4Bag(red) : 5137 events

NoBag(black): 5113 events

$$\triangle = 24/5137 = 0.47\%$$

For ee:

He4Bag(red):12758 events

NoBag(black): 12736 events

$$\triangle = 22/12758 = 0.17\%$$

- For ep and ee events come from target passing through He4 Bag, the energy loss and position shift are small.

Back ground simulation

the background come from beam hitting on the He4 Bag

Simulated 10^7 events , 51
events detected by Hycal.

After apply angle cut (angle
>0.8deg), only 1 events
left.

51 events out of 10^7 beam
input , without any cut

Convert to 1s beam time
($6 \cdot 10^{10}$) is about
 $3.0 \cdot 10^4$ events/s

our ep ee data is about
 $1.3 \cdot 10^3$ events/s

