

Back ground simulation for Vacuum box window

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Prad

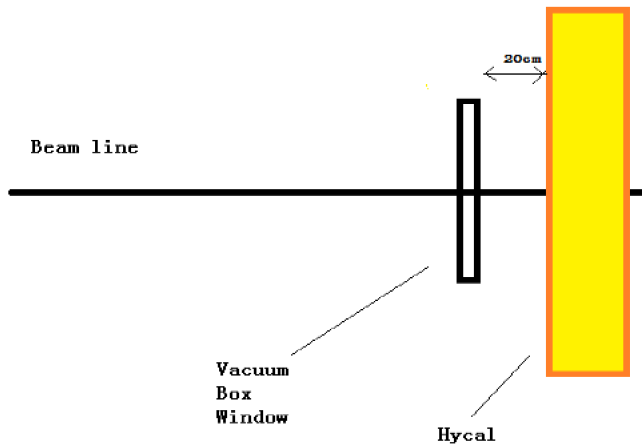
2014-03-07

Material and geometry setup

Vacuum Box Window

Material : Kapton -> Aluminium

3 thickness : 0.2mm 0.4mm 0.8mm



0.2mm Al window

Incident :

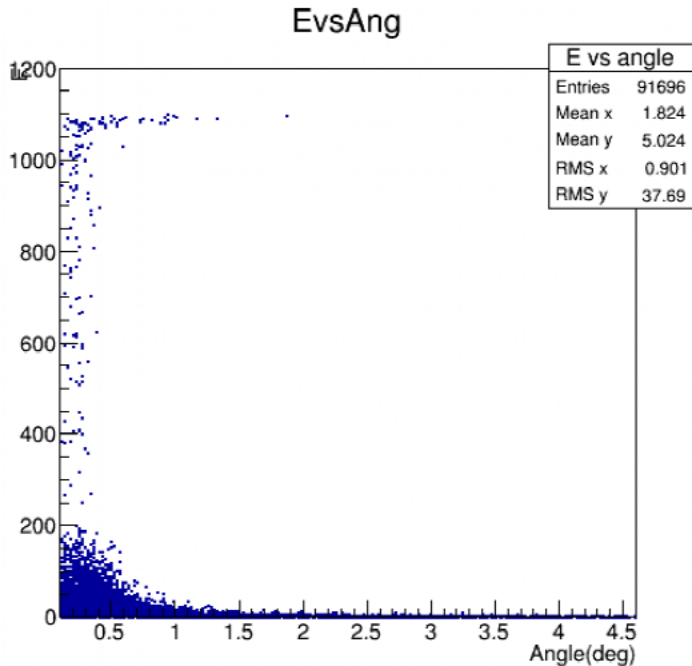
10^8 events

Back ground:

91696 events

~Without any cut

Most are low energy
and small angle events



0.4mm Al window

Incident :

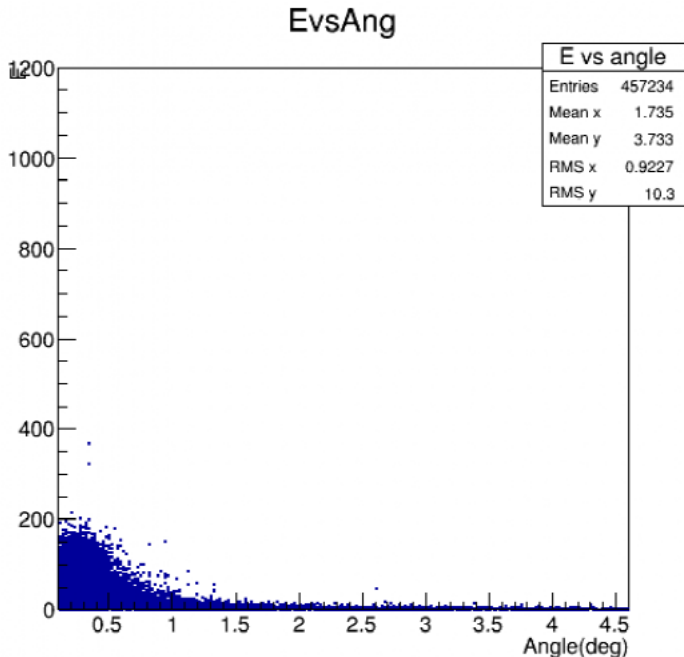
$6 \cdot 10^7$ events

Back ground:

457234 events

~Without any cut

Most are low energy
and small angle events



0.8mm Al window

Incident :

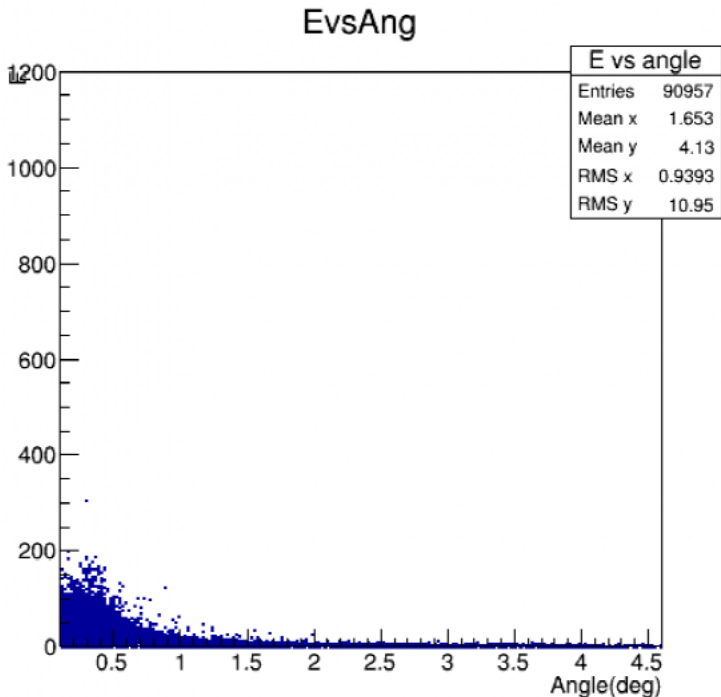
10^7 events

Back ground:

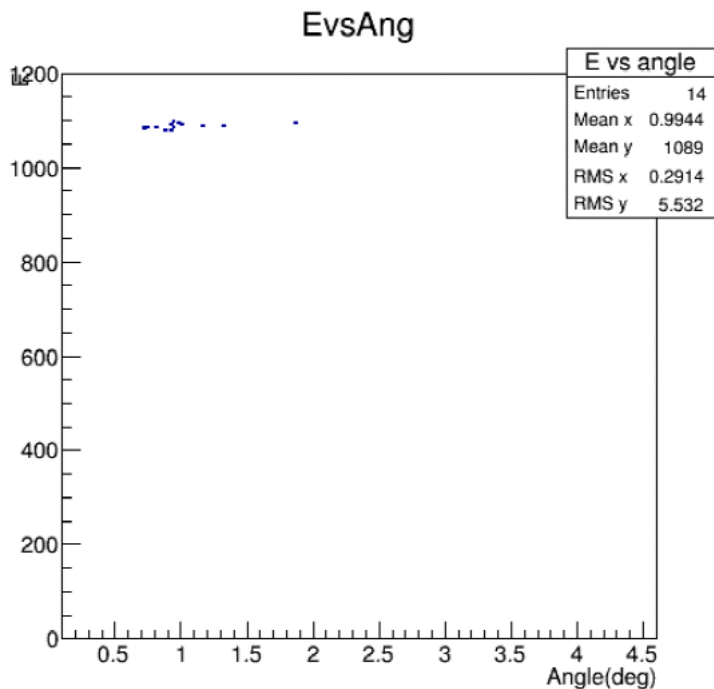
90957 events

~Without any cut

Most are low energy
and small angle events



Apply cut angle > 0.7 E > 200 MeV (0.2mm)



Back ground ratio for 3 windows

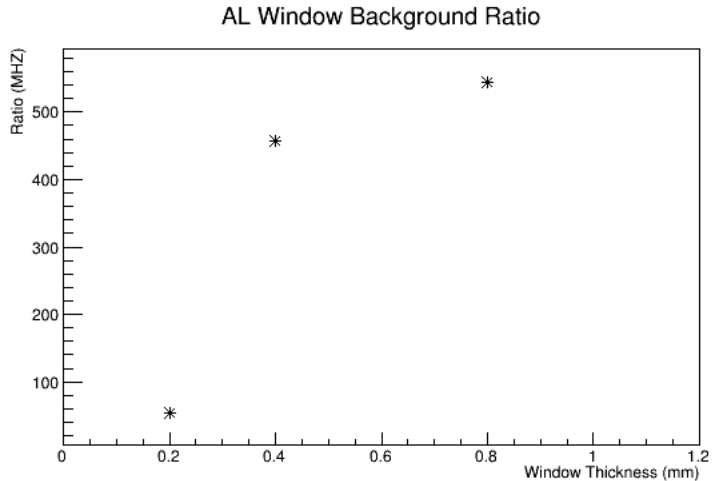
Ratio = (number of back ground)*($6 \cdot 10^{10}$ / number of incident) Hz

Without any cut

0.2mm ~ 55 MHz

0.4mm ~ 457 MHz

0.8mm ~ 545 MHz



Back ground ratio for 3 windows with cut

If apply cut $E > 200\text{MeV}$ Angle > 0.7 deg

0.2mm ~ 8 KHz

0.4mm ~ 0 KHz

0.8mm ~ 0 KHz

summery

If we use 0.2mm 0.4mm 0.8mm Aluminium as vacuum box window

The back ground will increase,

with out any cut its around Mhz level.

If use cut Angle $>0.7\text{deg}$, $E >200\text{MeV}$,

For 0.2mm window, has 8Khz high energy back ground. Same level as signal.

For 0.4mm 0.8mm windows should be worse, but didn't show in this simulation, maybe because the statistics was not enough, need to do more simulation