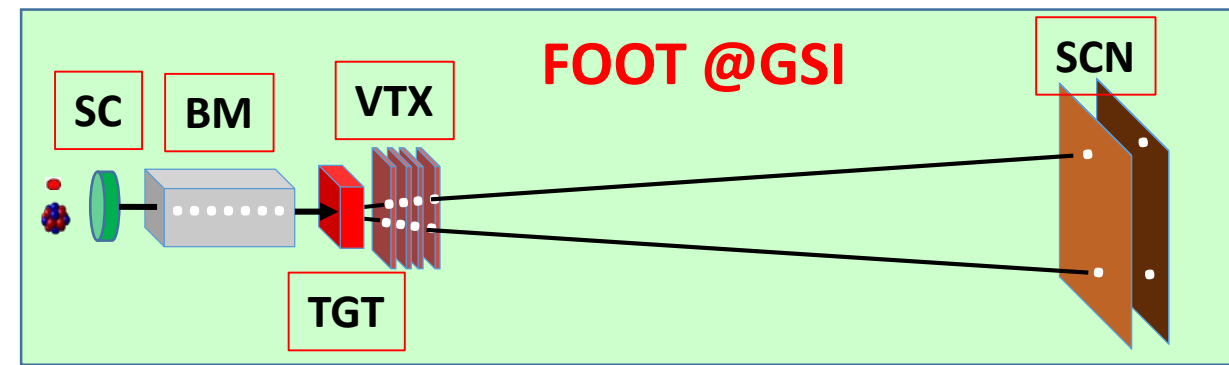


Analysis of simulated data



Input data

`/gpfs_data/local/foot/Simulation/V15/16O_C2H4_gsi_1(and 2).root`

TGT: C₂H₄ 2mm
SCN at 1 m

2x10⁷ primaries
230625 fragmentations: **1.15%**

`/gpfs_data/local/foot/Simulation/V15/16O_C2H4_gsi_150_1(and 2).root`

TGT: C₂H₄ 2mm
SCN at 1.5 m

2x10⁷ primaries
230686 fragmentations: **1.15%**

`/gpfs_data/local/foot/Simulation/V15/16O_C_gsi_1(and 2).root`

TGT: C 2mm ($\rho=1.83 \text{ g/cm}^3$)
SCN at 1.0 m

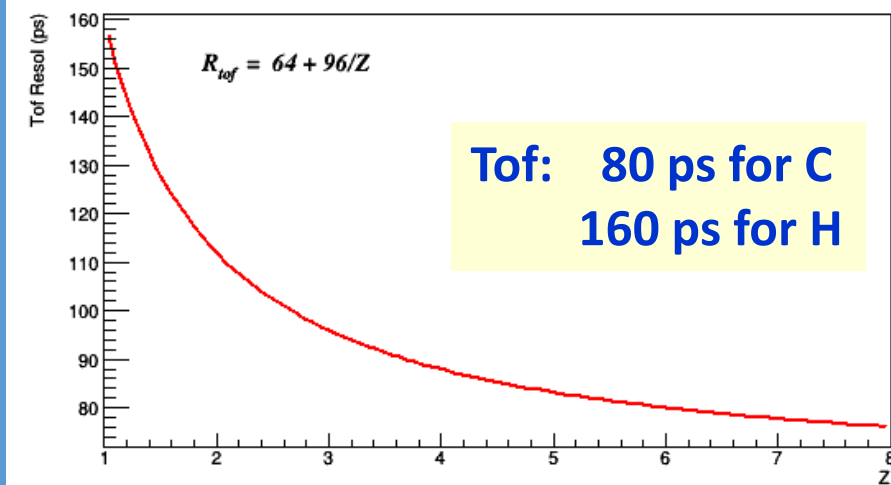
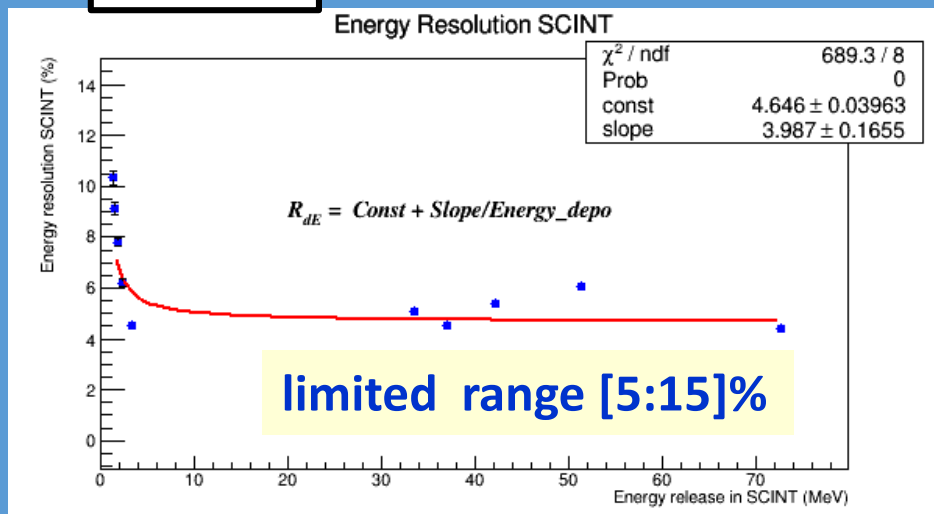
1x10⁷ primaries
160154 fragmentations: **1.60%**

Resolution

dE/dx

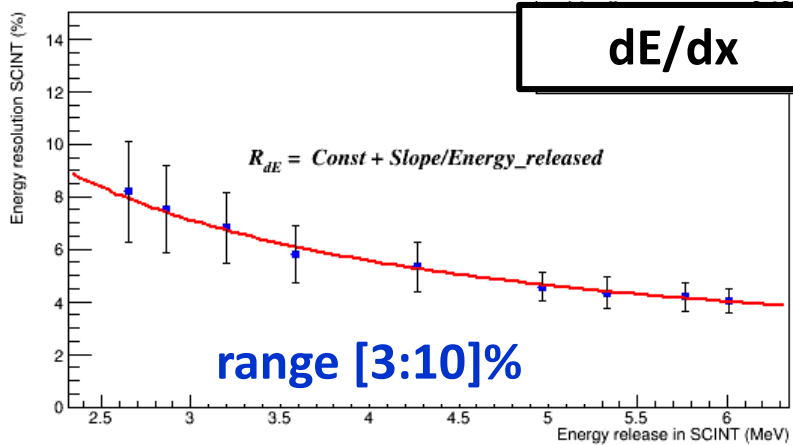
Resolutions for GSI

Tof

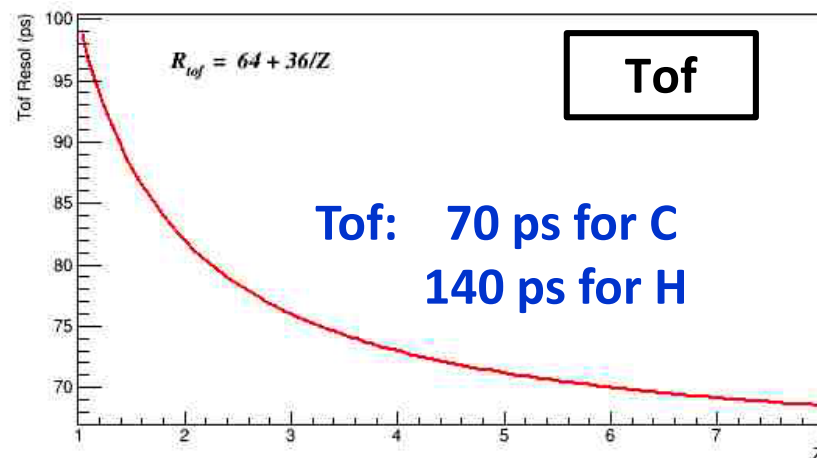


Previous Resolutions

dE/dx



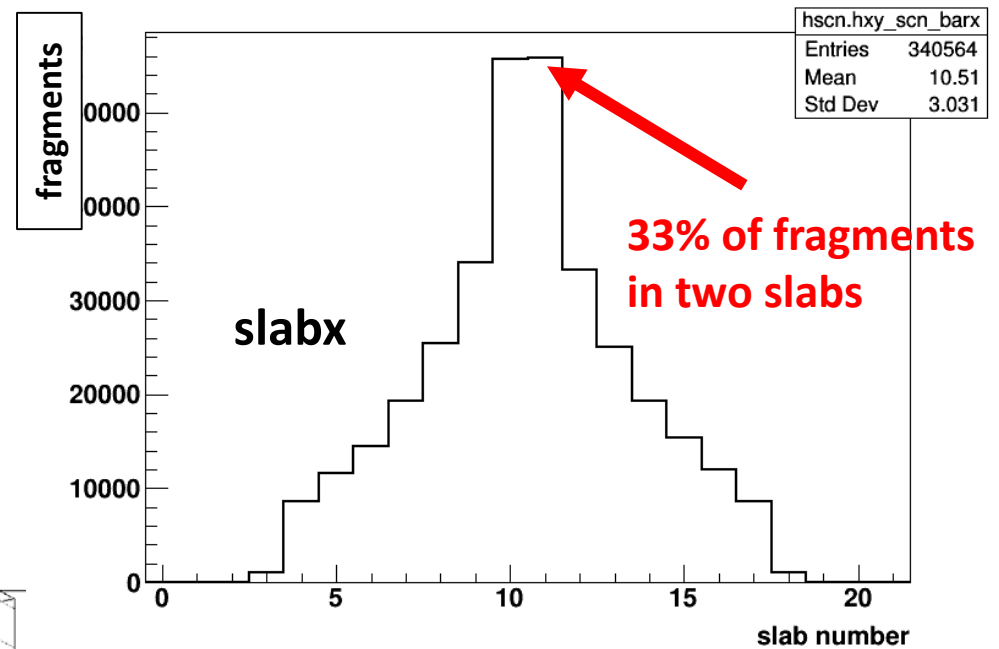
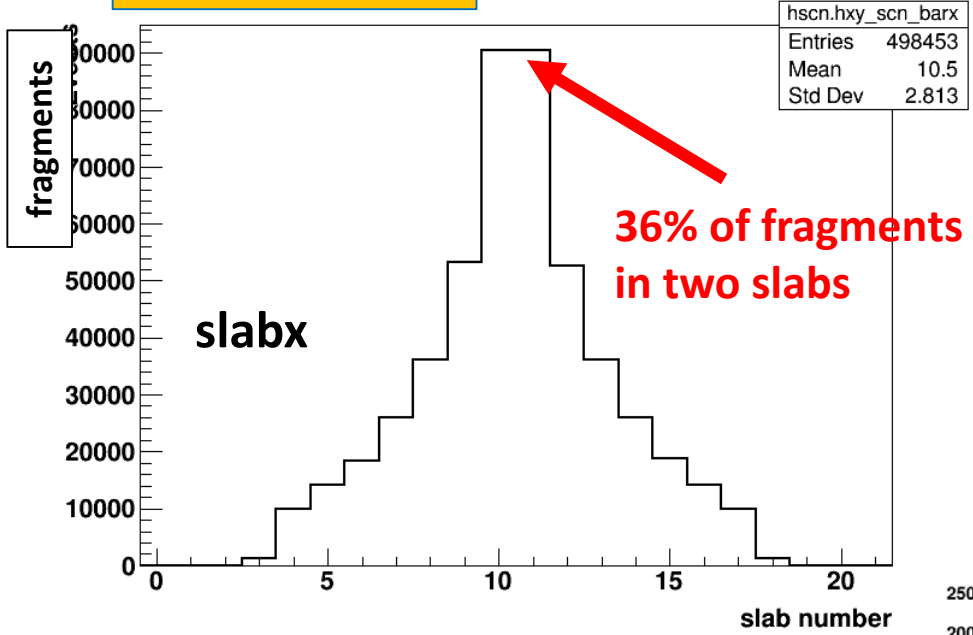
Tof



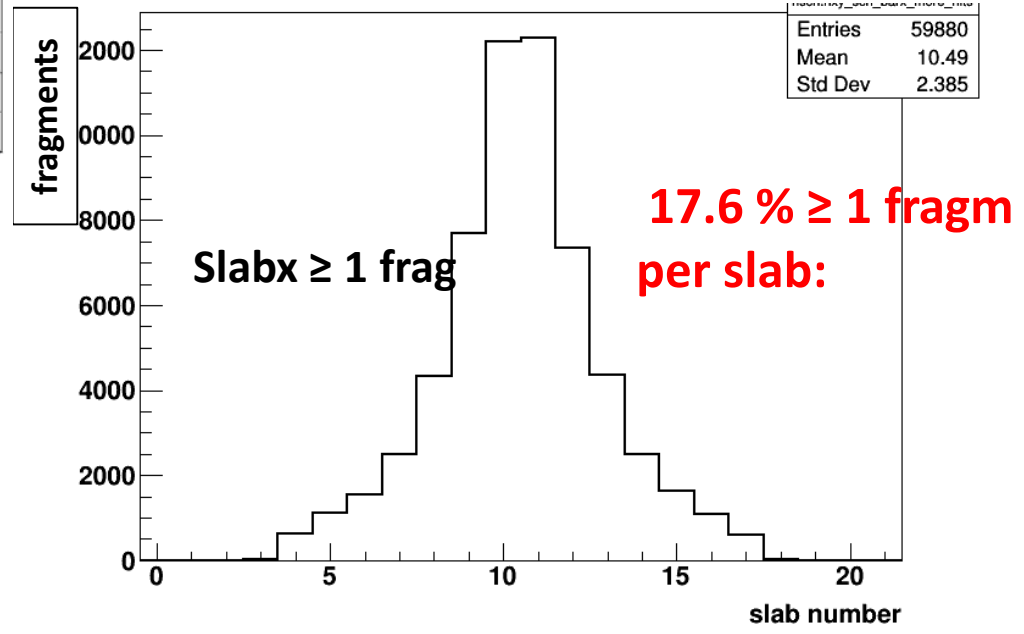
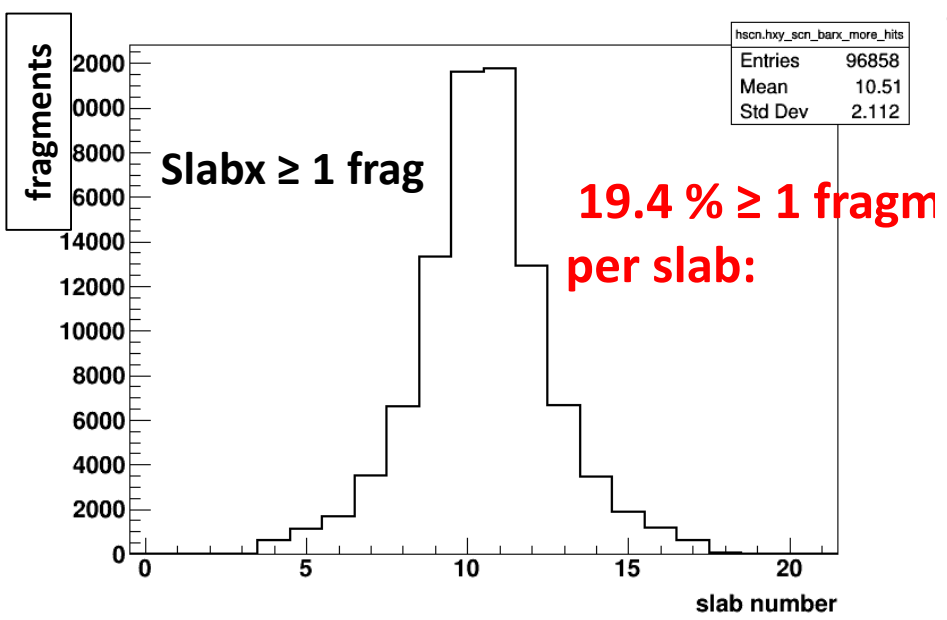
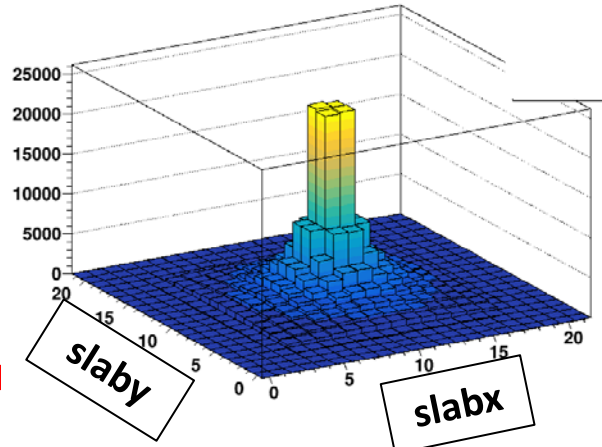
SCN OCCUPANCY: TARGET COMPARISON, (SCN at 1m)

TGT C₂H₄

TGT C

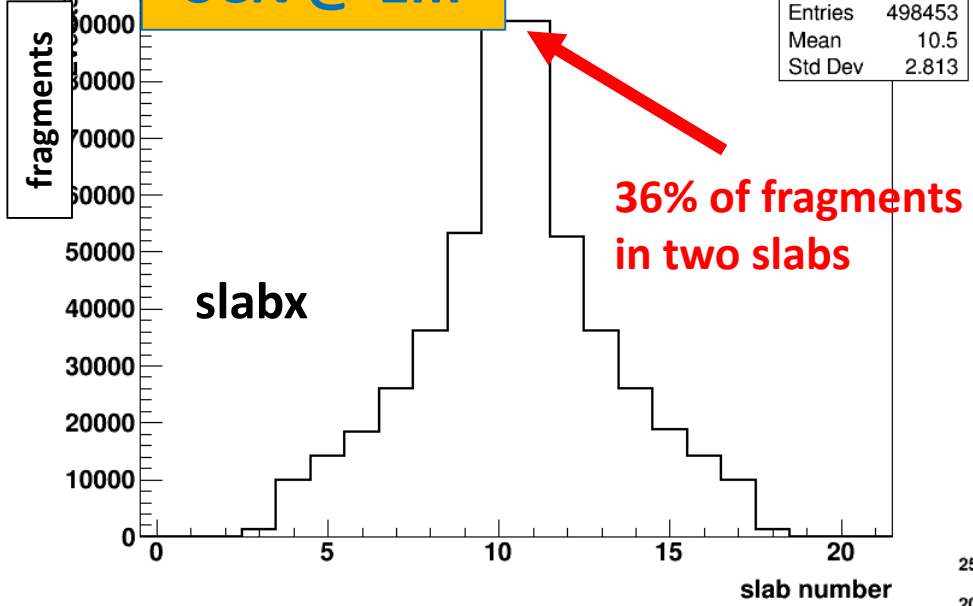


Same distribution for slaby

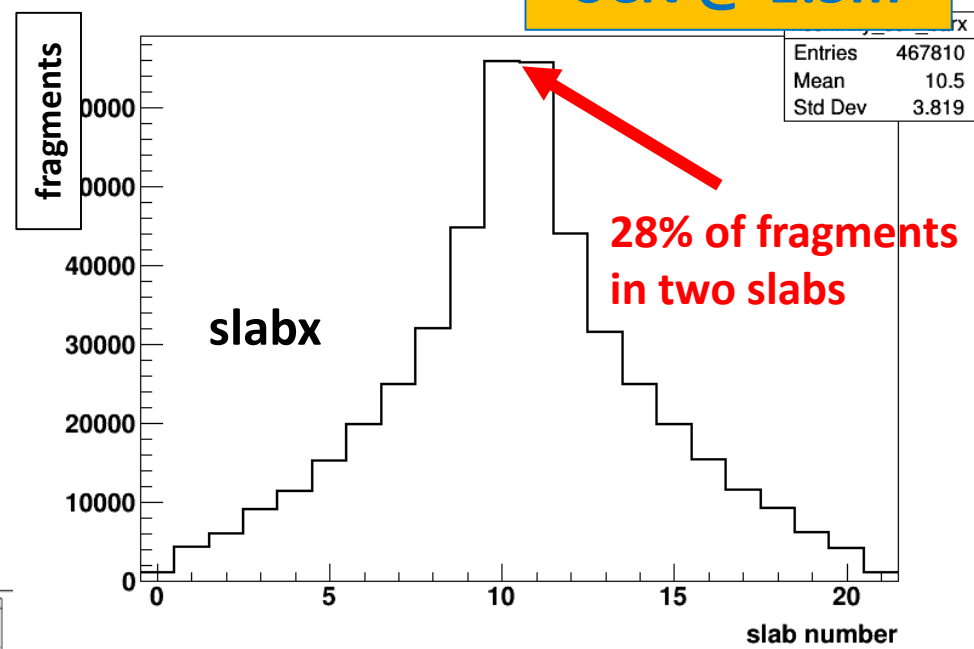


SCN OCCUPANCY: 1 and 1.5 m from target (C₂H₄)

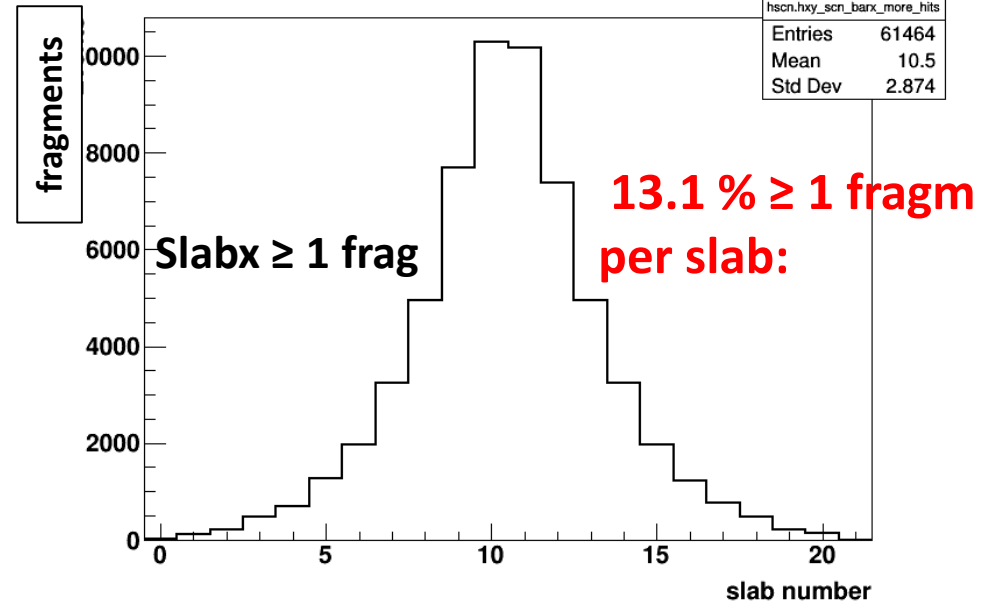
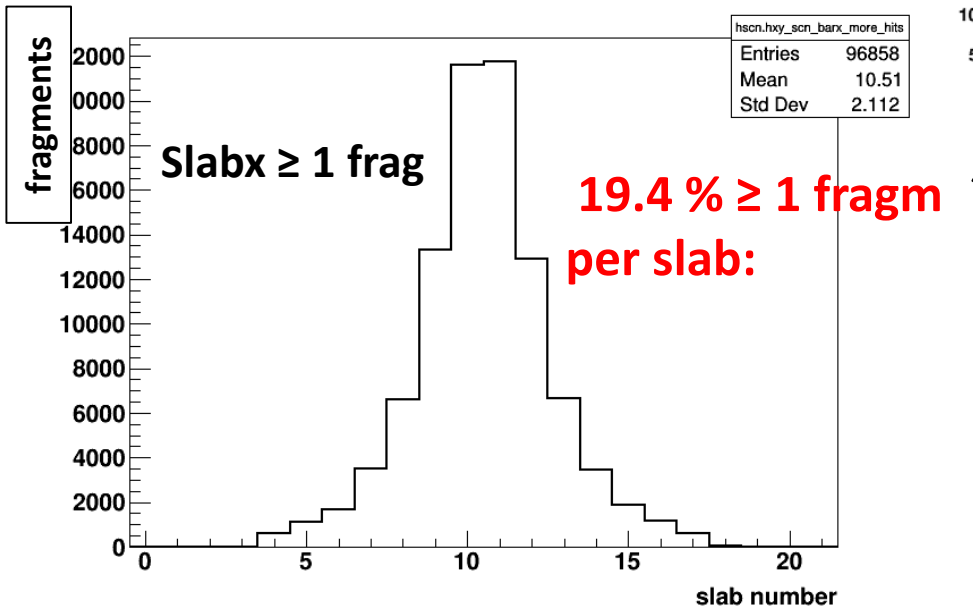
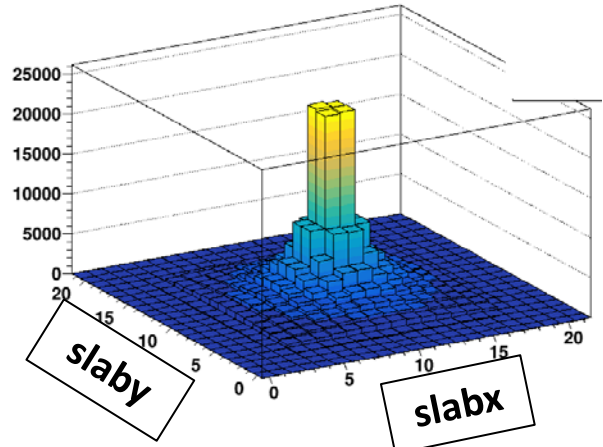
SCN @ 1m



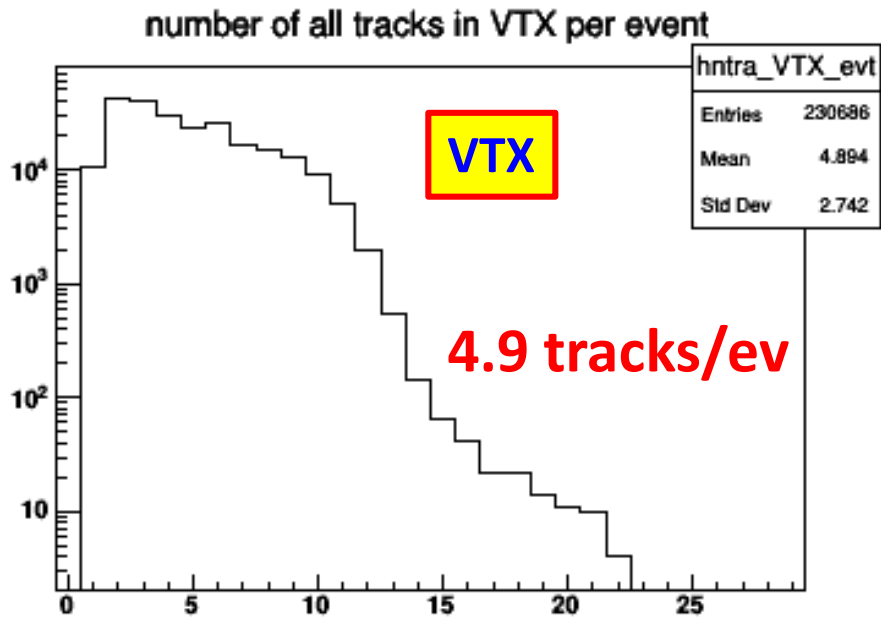
SCN @ 1.5m



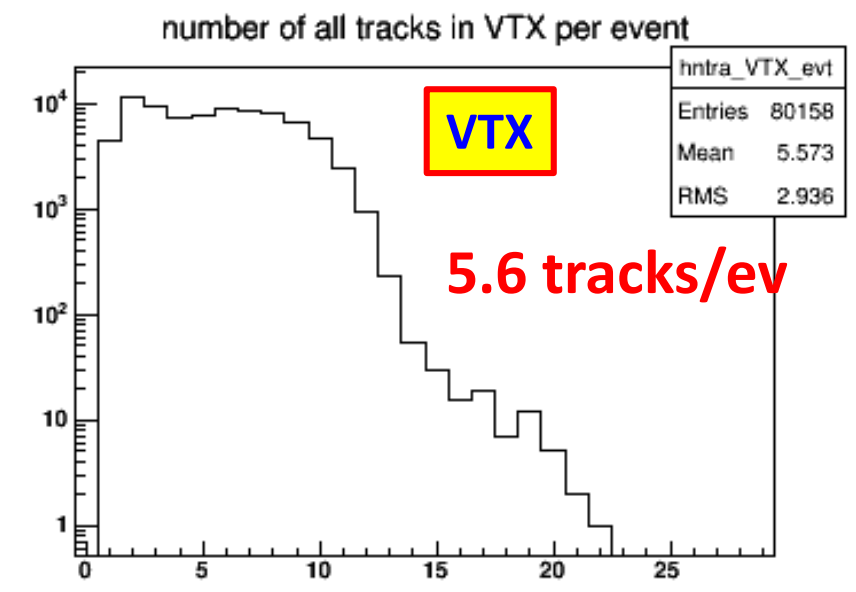
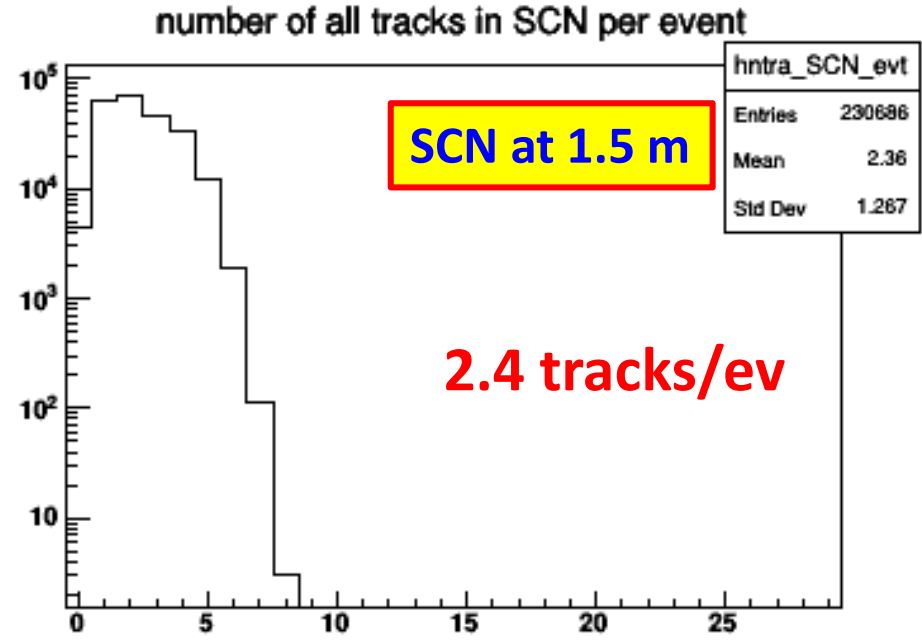
Same distribution for slaby



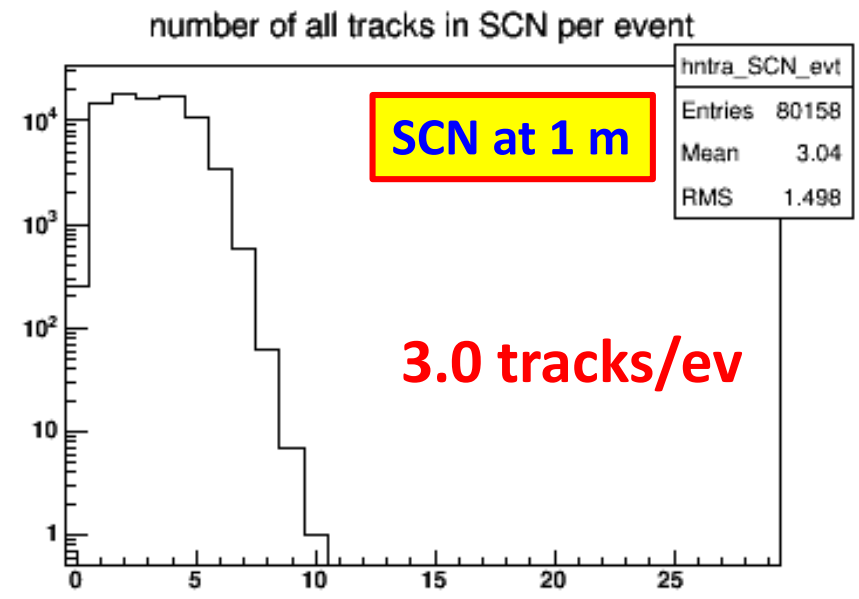
TRACKS per event: C₂H₄ and C Target



C₂H₄ Target

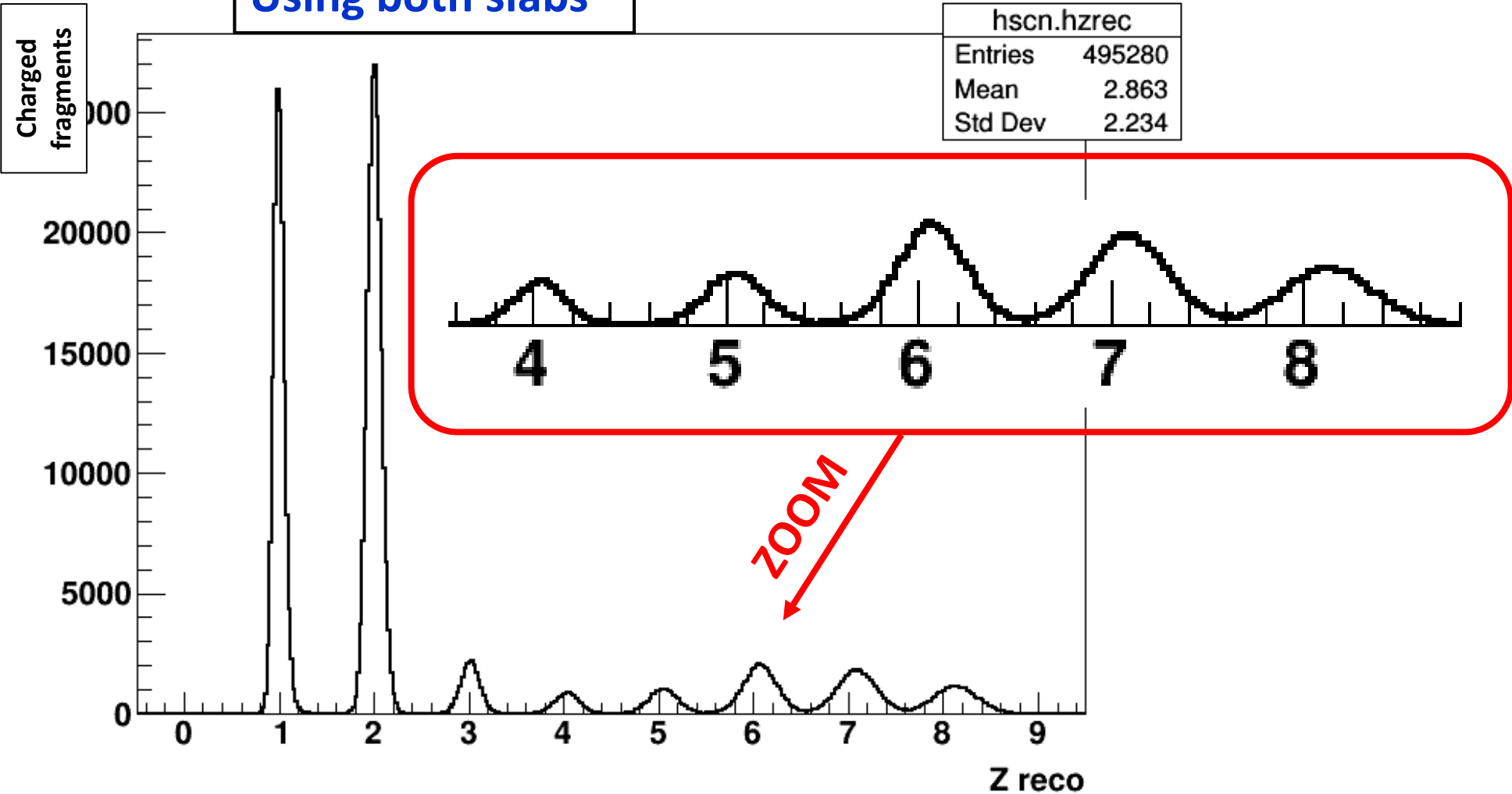


C Target



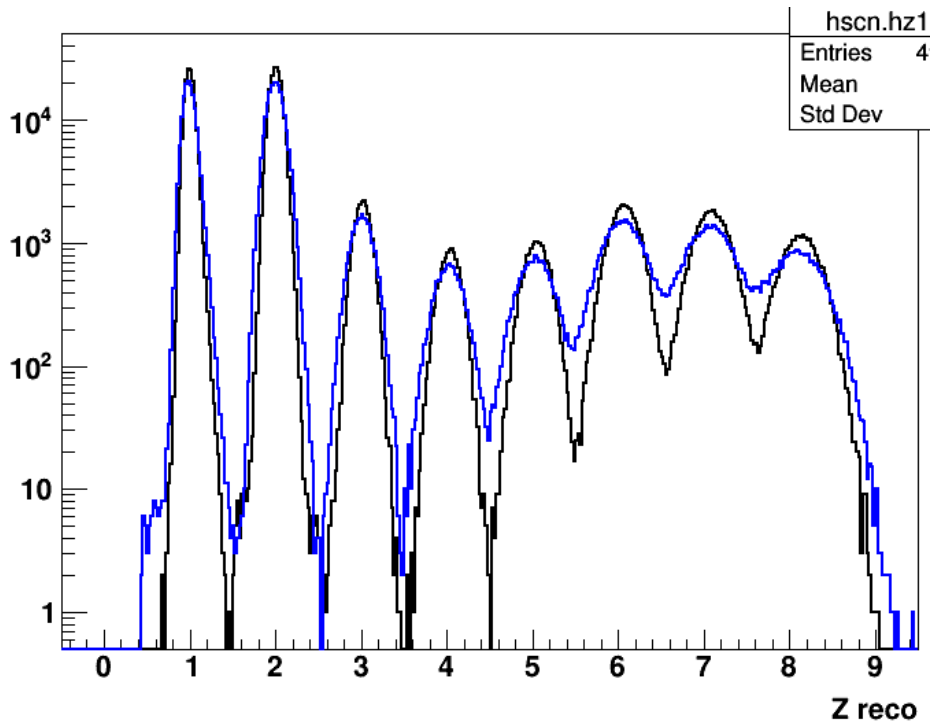
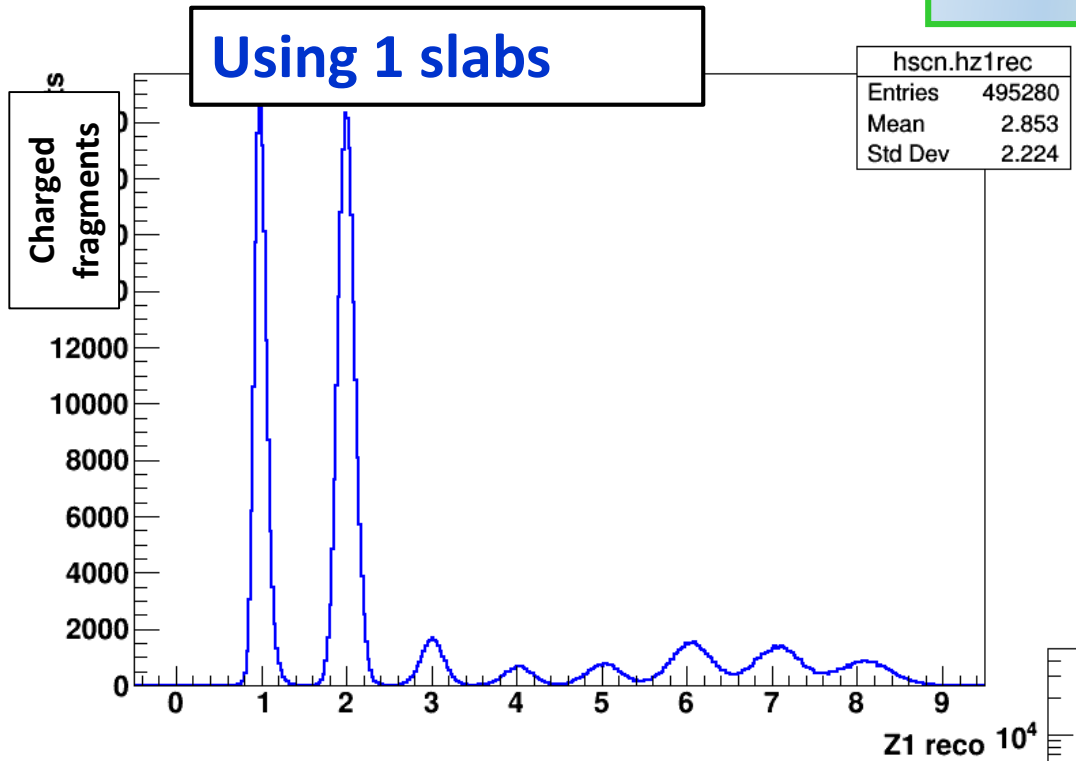
Z reconstruction, 2 slabs

Using both slabs

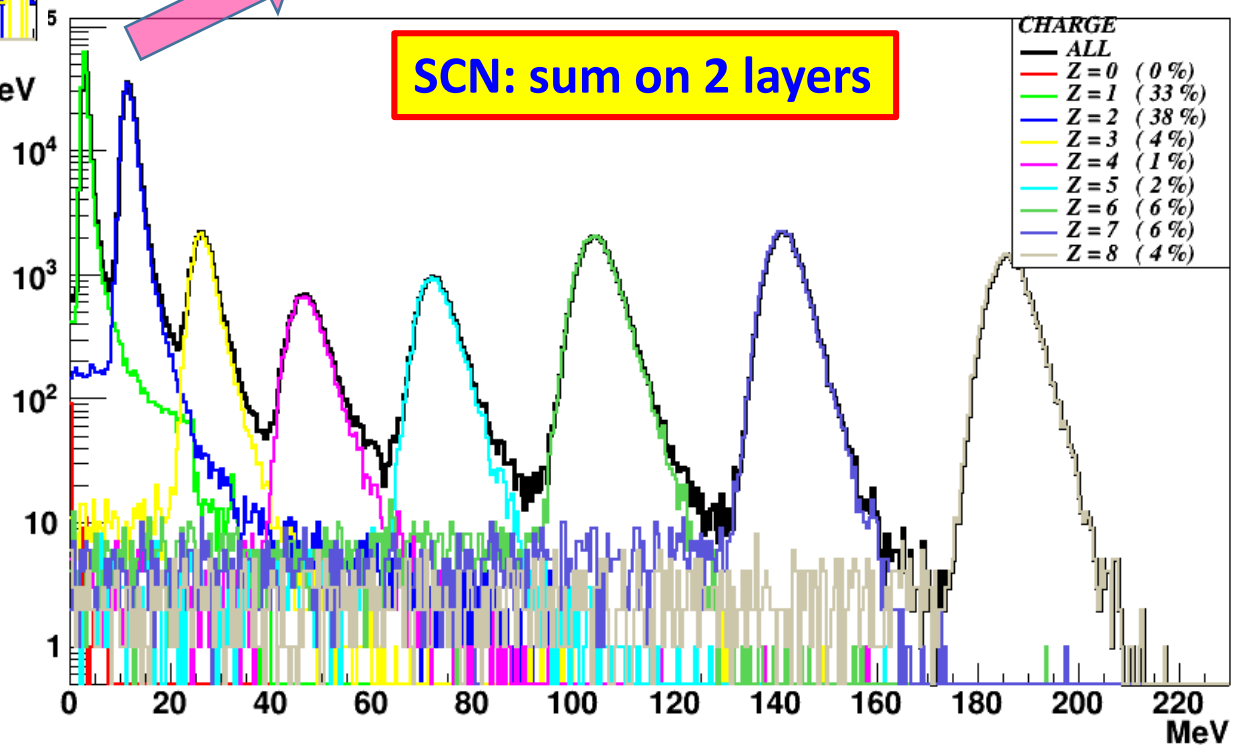
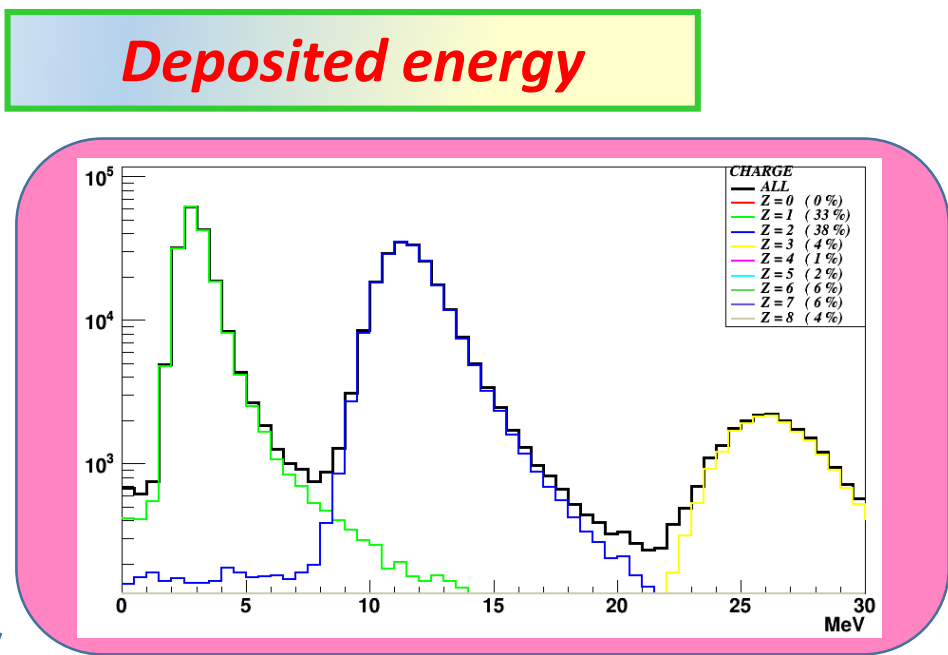
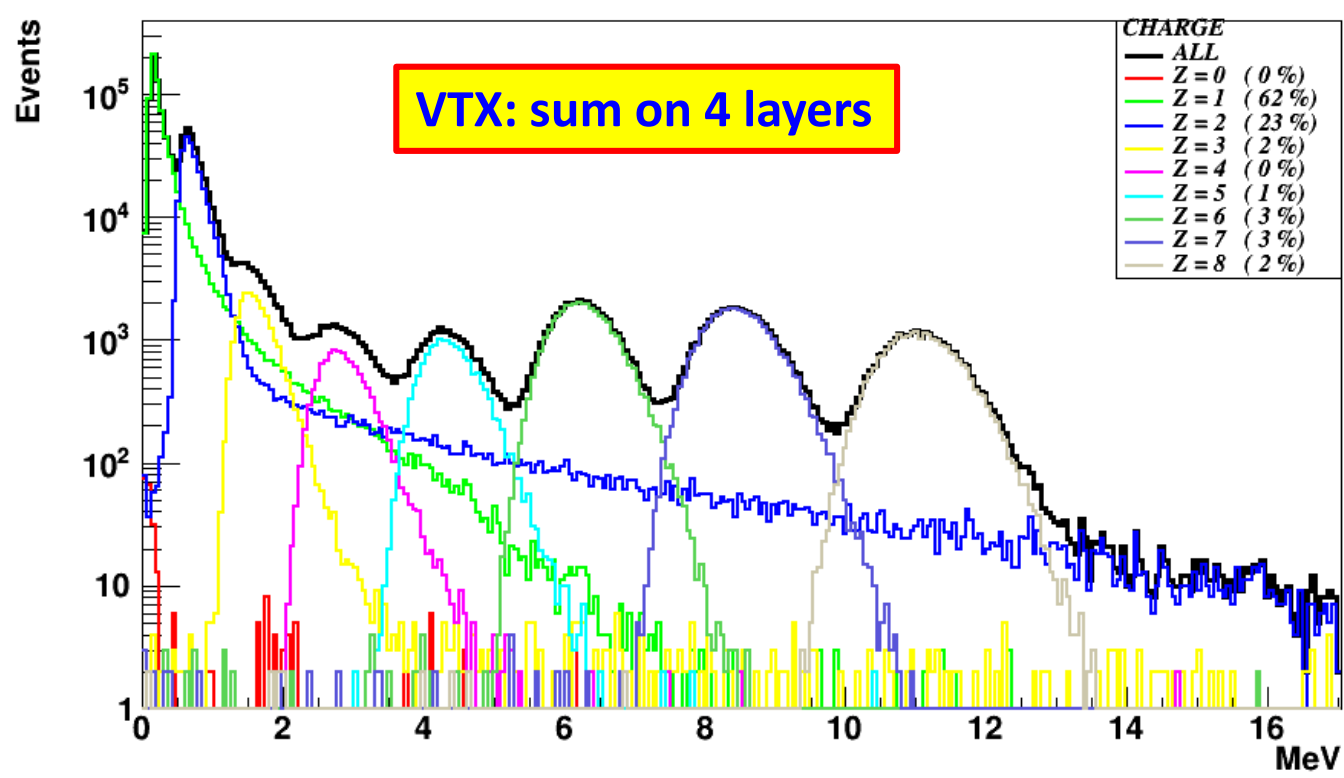


No problem for Z identification with 2 slabs

Z reconstruction, 1 slab



No problem for Z identification of light fragments, worst for heavier



Statistics

Requirements:

- ❑ No pile up in VTX (600 μ s to reconstruct the event \rightarrow max beam rate 1.6 KHz)
- ❑ With a C₂H₄ Target (2 mm) \rightarrow 1.15% of fragmentation



Beam rate at 10^3 particle (¹⁶O) / s



~ 10 fragmentations/ s \rightarrow 36 K fragmentations/ h

Is it possible to measure Total σ or $d\sigma/d\Omega$?

Statistics to acquire

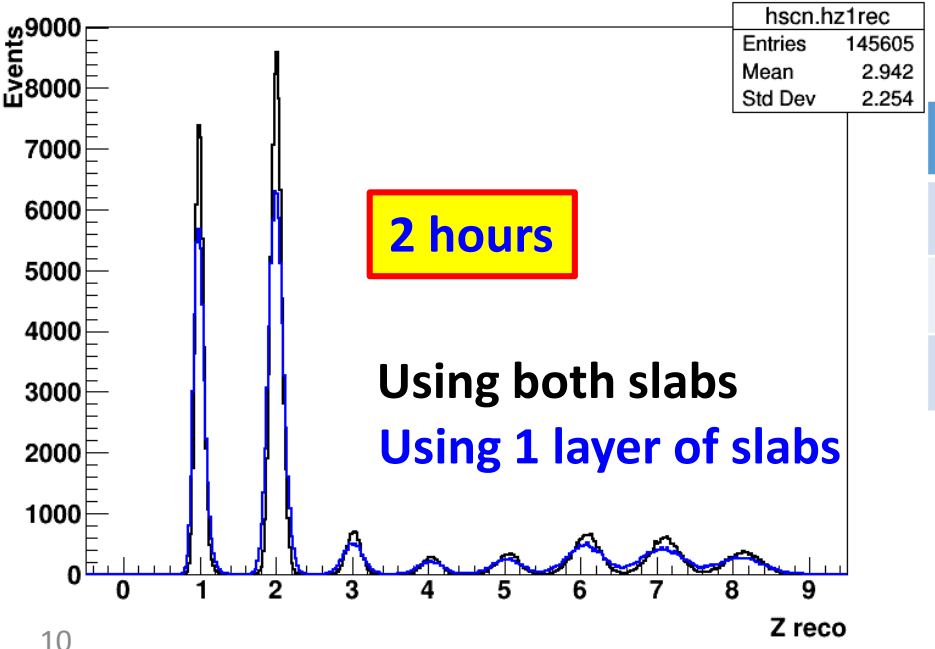
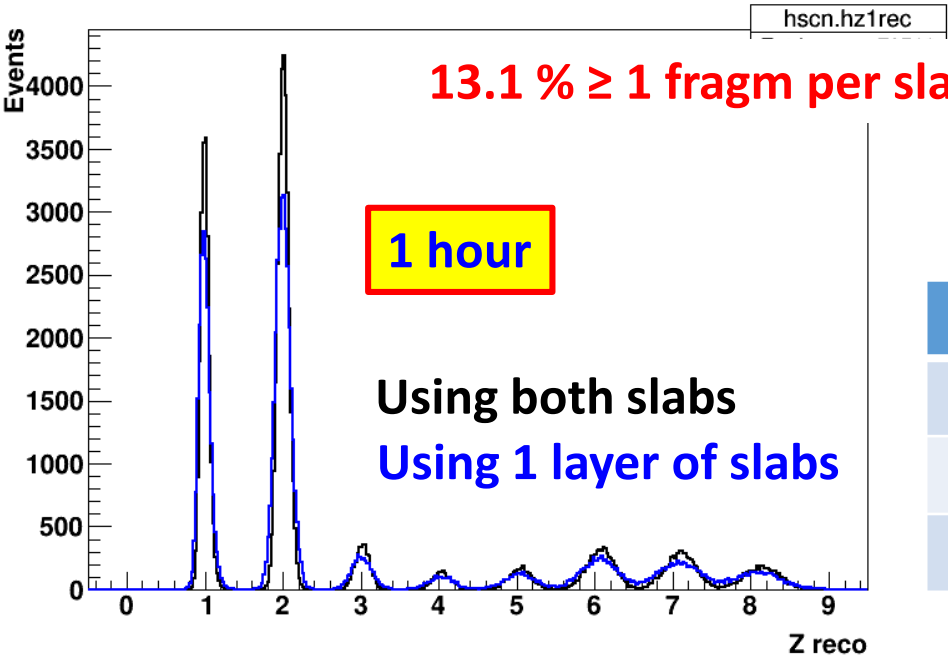
1 hour of data taking (36K fragmentations)

Z	1	2	3	4	5	6	7	8
Fragm (K)	20	30	3.3	1.6	2.4	5.6	5.6	3.9
« .» -13%	17.5	26	3.0	1.4	2.1	4.5	4.5	3.4
Stat. Error %	0.8	0.6	1.8	2.7	2.2	1.5	1.5	1.7

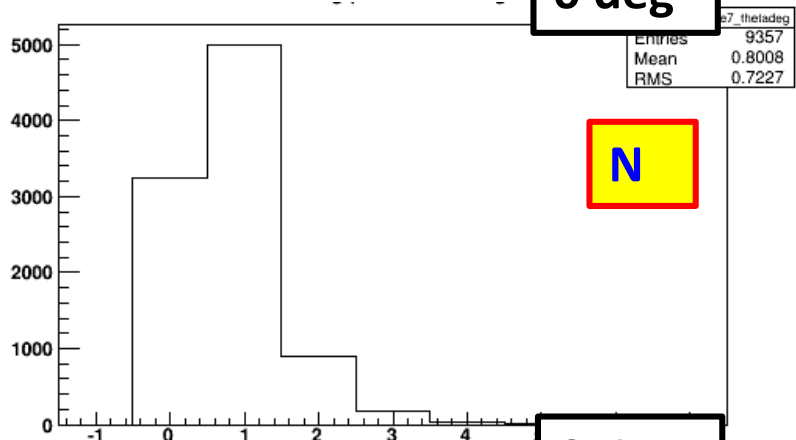
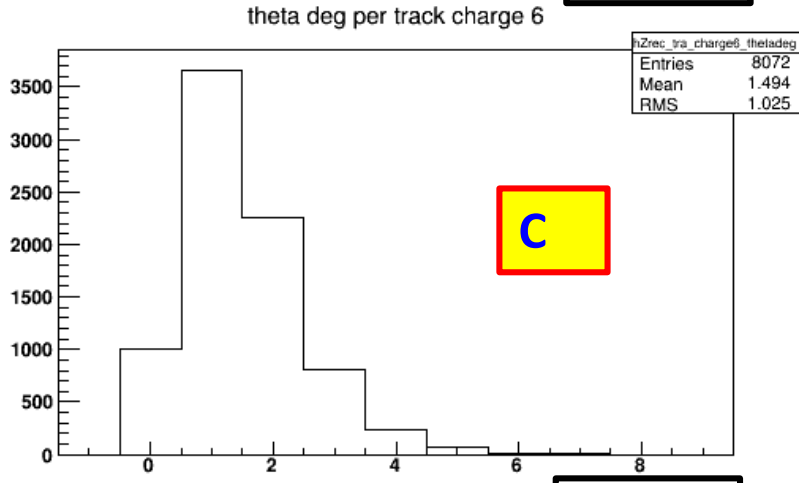
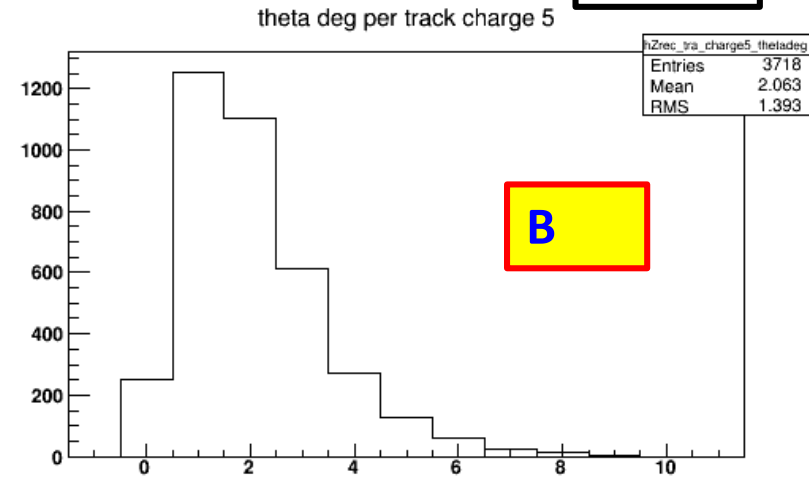
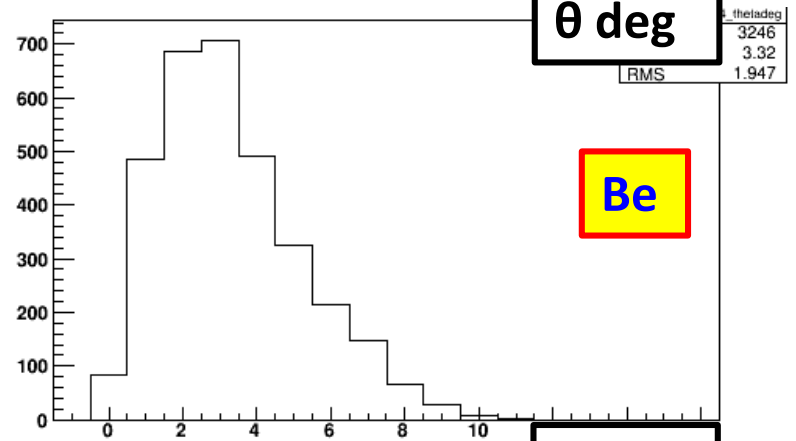
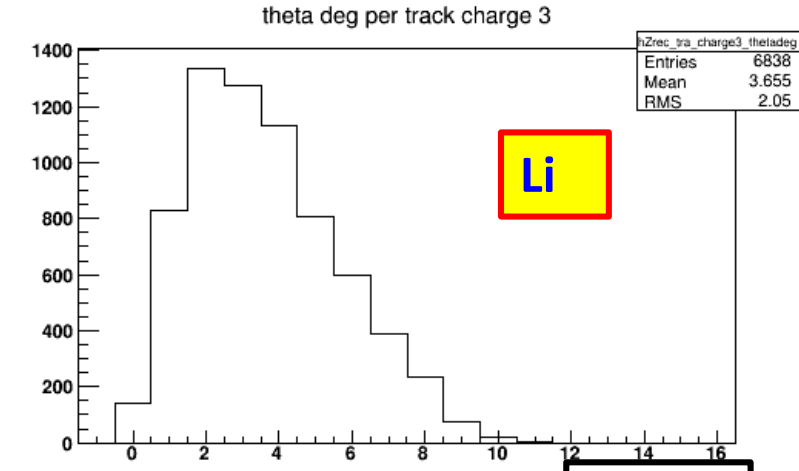
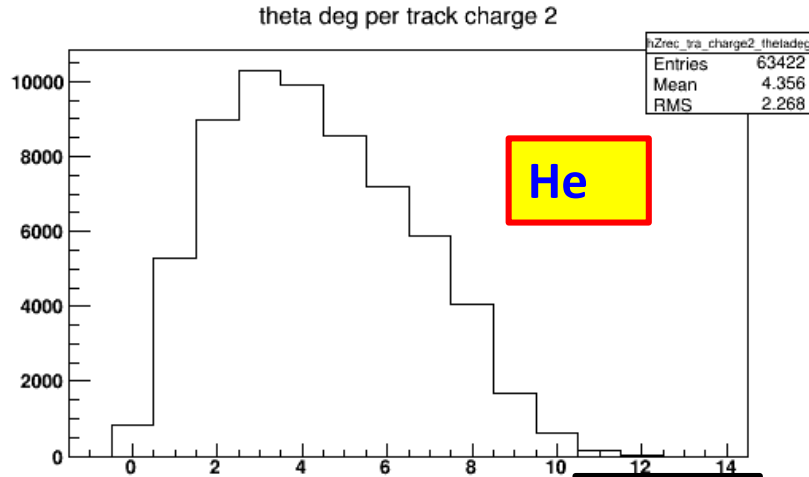
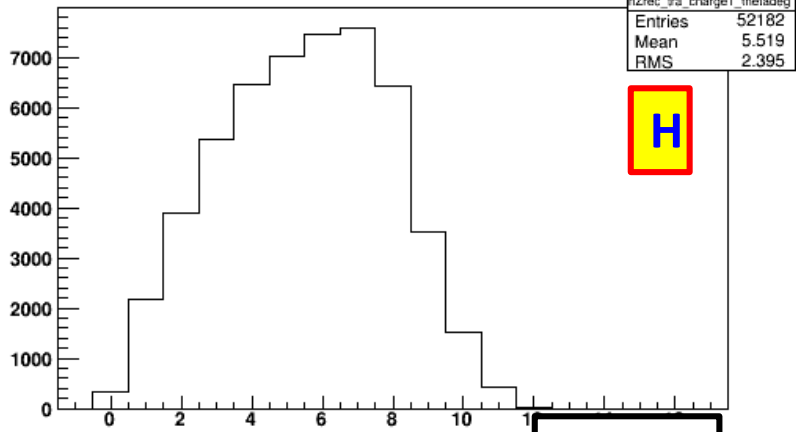
2 hours of data taking (72K fragmentations)

Z	1	2	3	4	5	6	7	8
Fragm (K)	40	60	6.6	3.2	4.8	11.2	11.2	7.8
« .» -13%	35	52	6.0	2.8	4.2	9.0	9.0	6.8
Stat. Error %	0.5	0.4	1.3	1.9	1.5	1.0	1.0	1.2

Total cross section is possible.
 Differential? Probably with ≥ 2 hours of data taking



2 hours of data taking: $d\sigma/d\Omega$



- ❑ *Statistical problem on Li, Be, B*
- ❑ *Necessary high direction precision for heavy fragments*