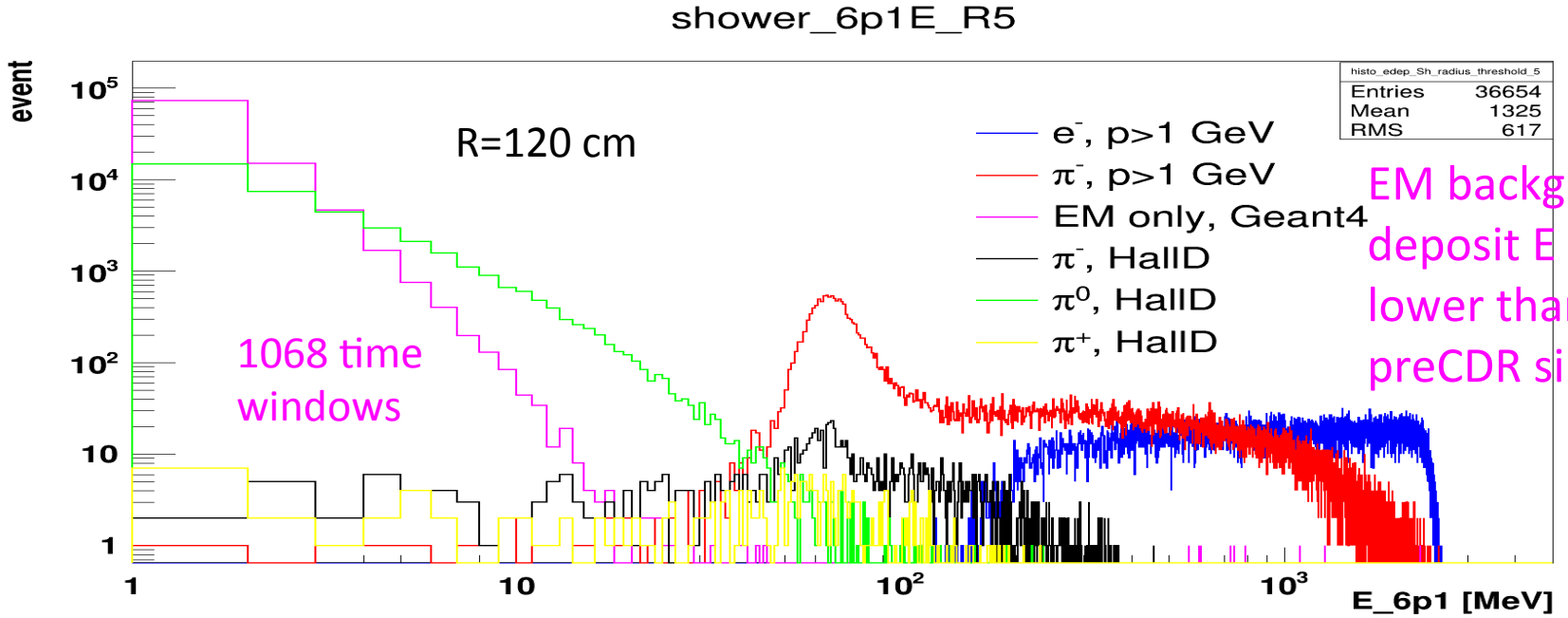
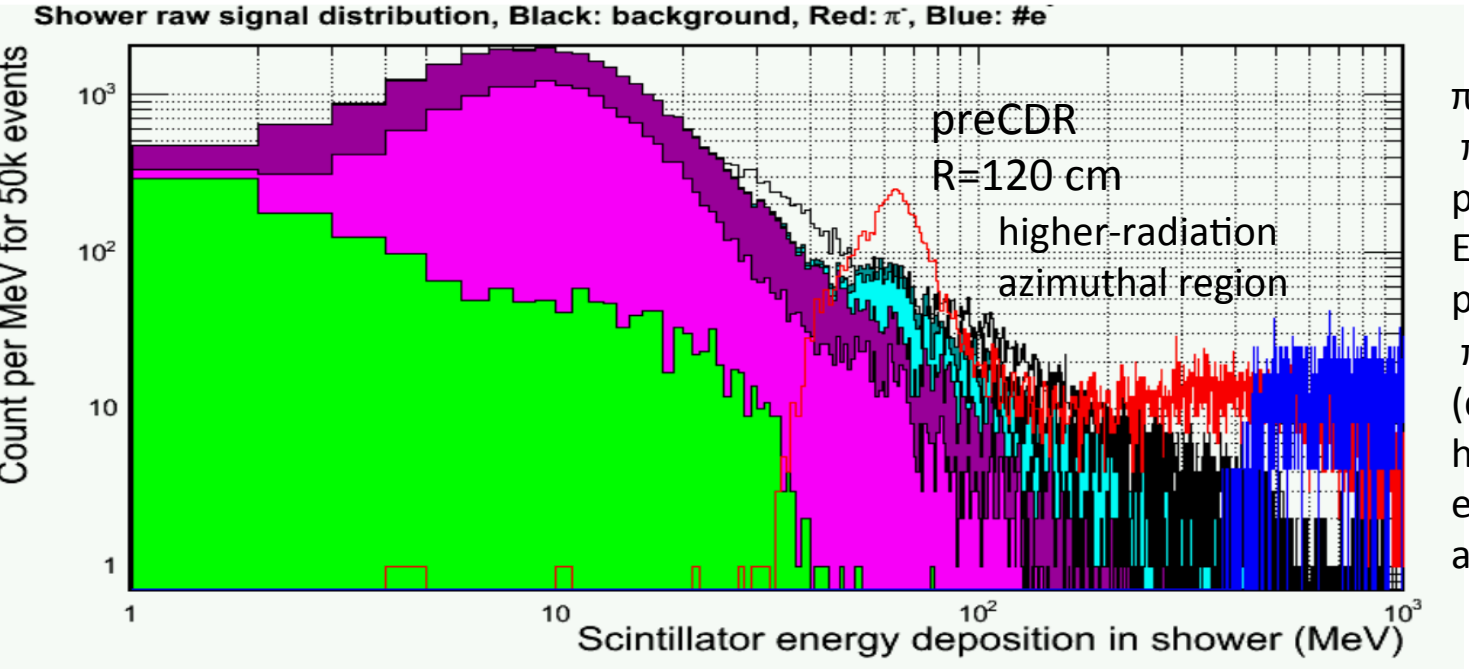
PVDIS Backgrounds Study Updates

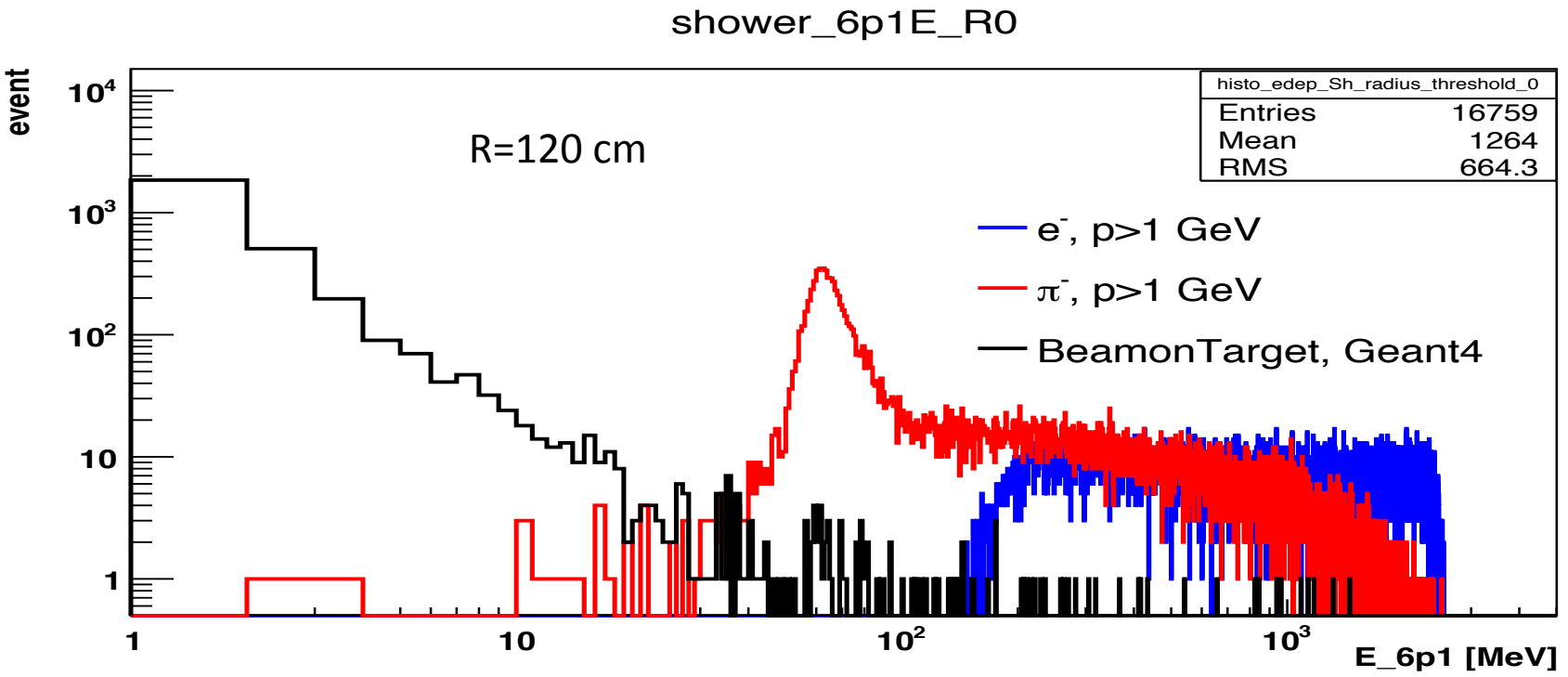
11/02/2017

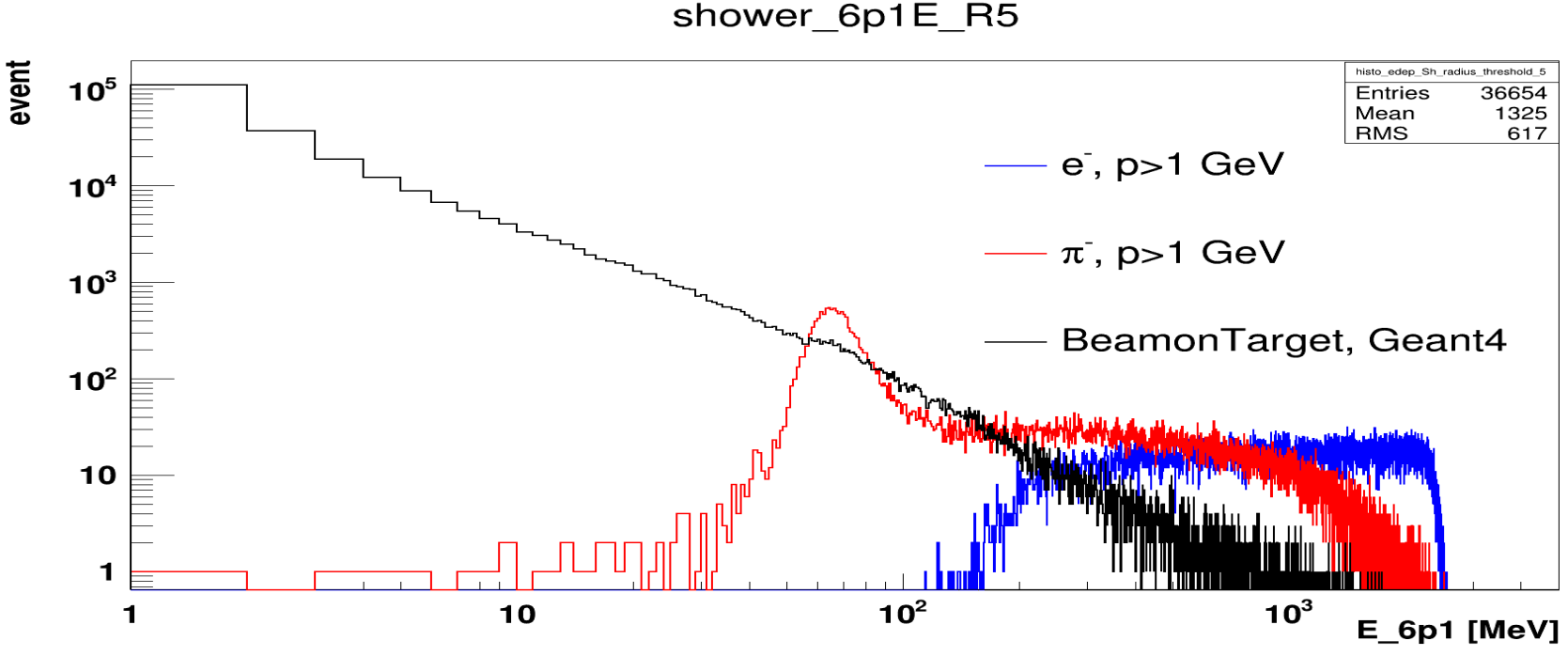




π− (light blue),
π+ (dark blue),
protons (yellow),
EM process-originated photons (magenta)
π0-originated photons (dark magenta).
high energy pion (red) and electrons (blue) are shown as non-filled curves.

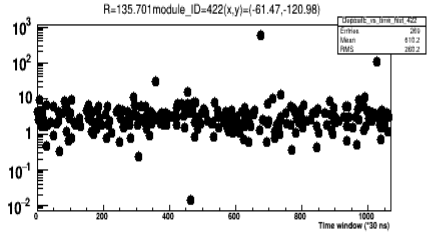
Stacked probability (count per 50k events) vs. Shower scintillator energy deposition for incoming background electrons (green)

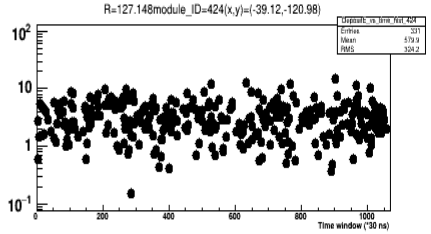

shower_6p1E_R0
event
R=120 cm
histo_edep_Sh_radius_threshold_0
Entries 16759
Mean 1264
RMS 664.3
e⁻, p>1 GeV
π⁻, p>1 GeV
BeamonTarget, Geant4
E_6p1 [MeV]

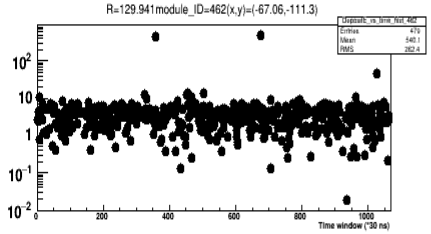

shower_6p1E_R5
event
histo_edep_Sh_radius_threshold_5
Entries 36654
Mean 1325
RMS 617
e⁻, p>1 GeV
π⁻, p>1 GeV
BeamonTarget, Geant4
E_6p1 [MeV]

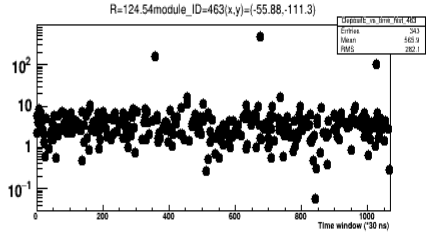
6p1 Deposit E vs Time Windows for Individual Module

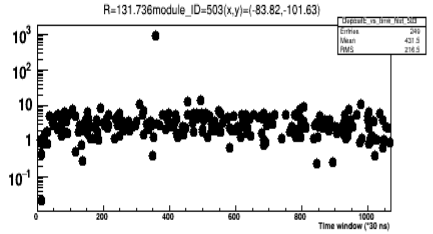
EM background only

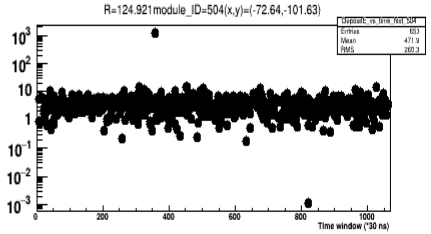


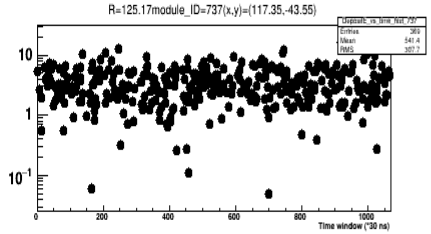


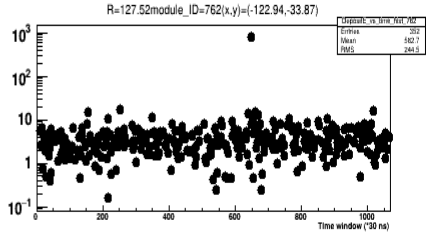


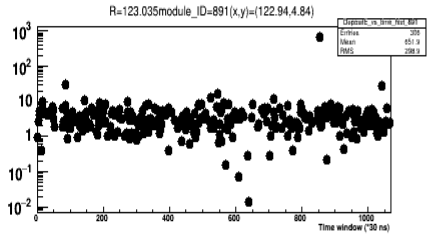


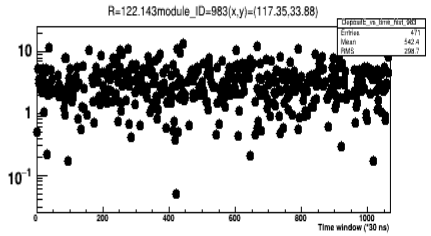


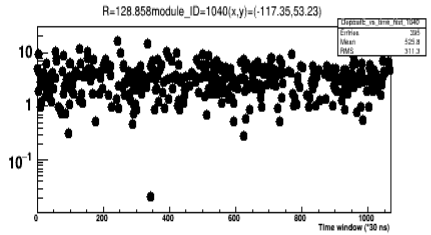


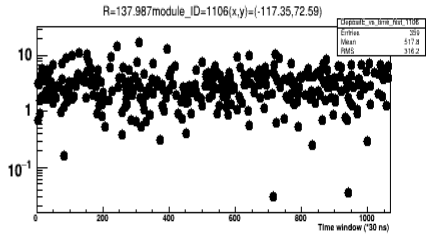


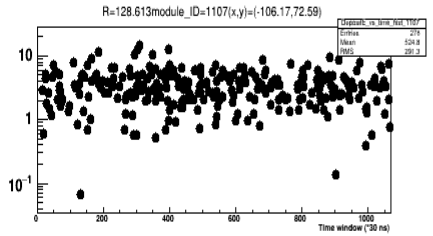


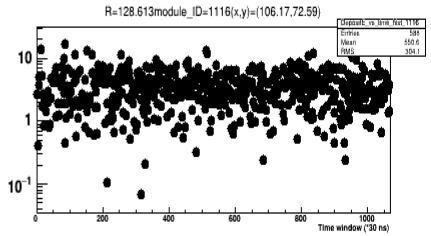


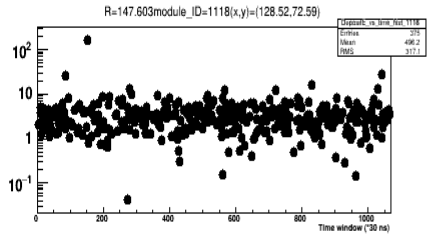


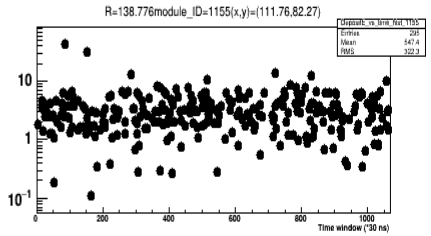


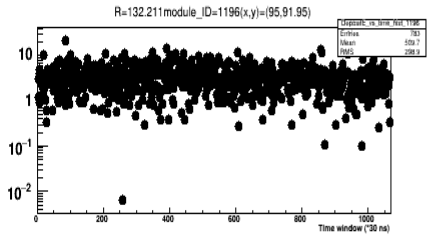


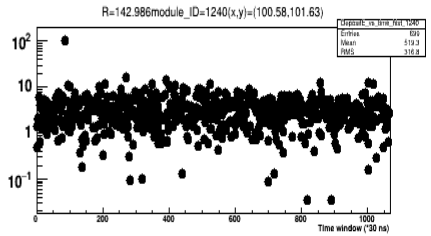


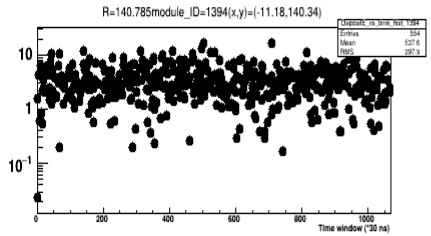








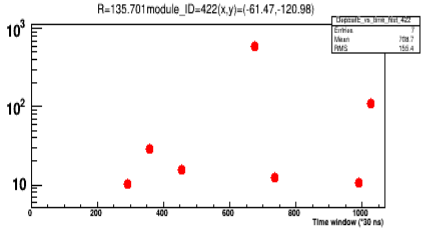


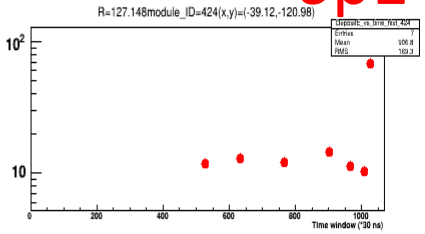


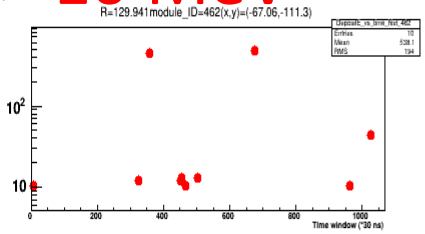
6p1 Deposit E vs Time Windows for Individual Module

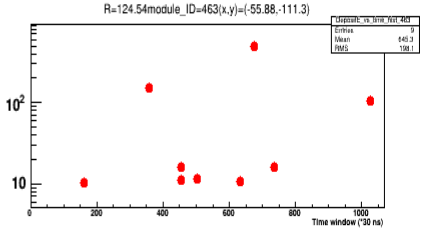
EM background only

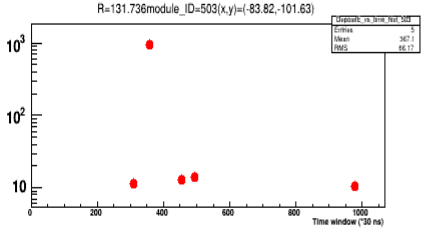
6p1 E > 10 MeV

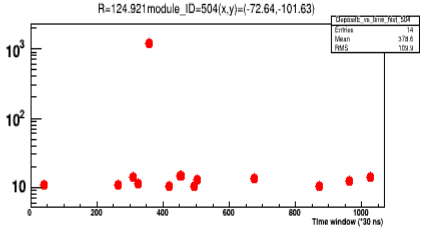


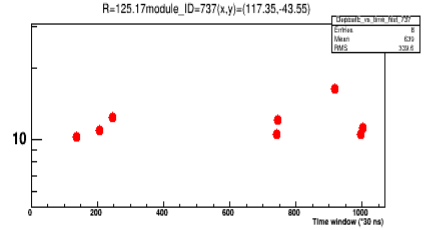


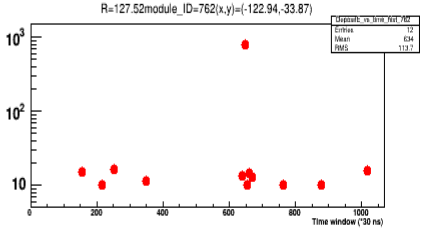


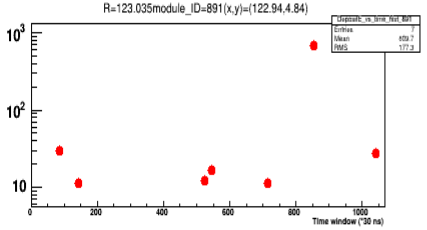


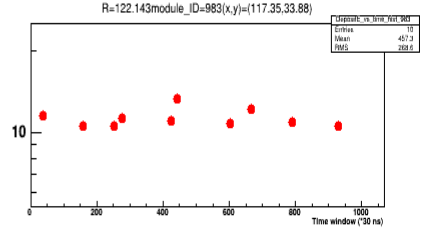


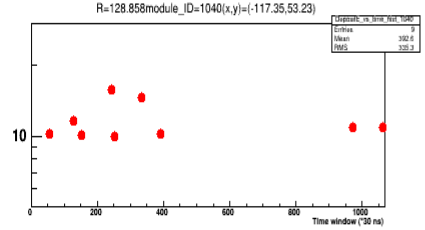


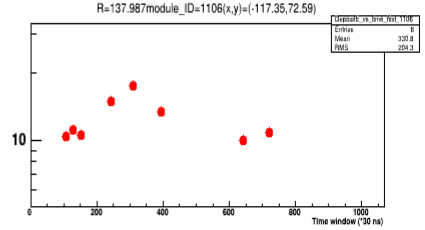


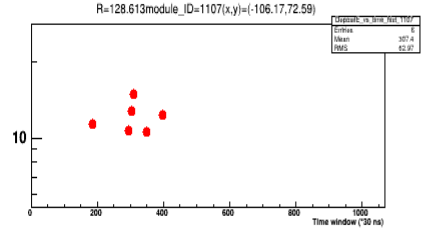


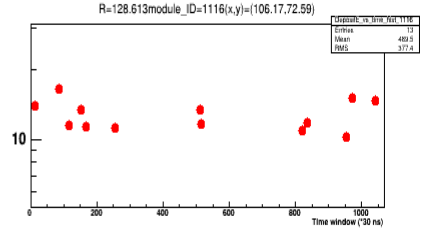


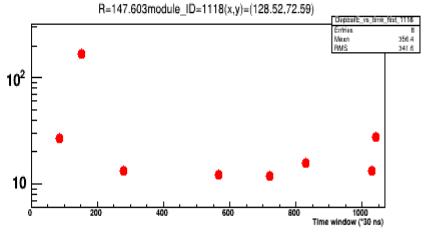


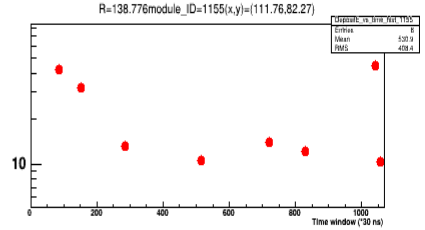


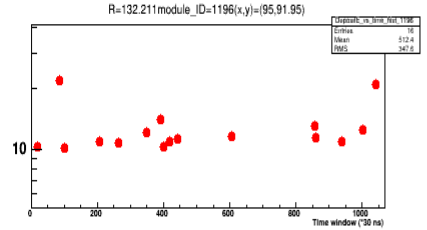


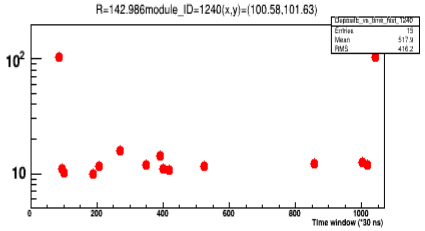


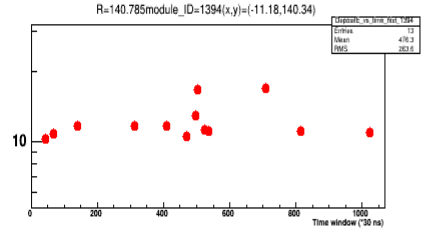




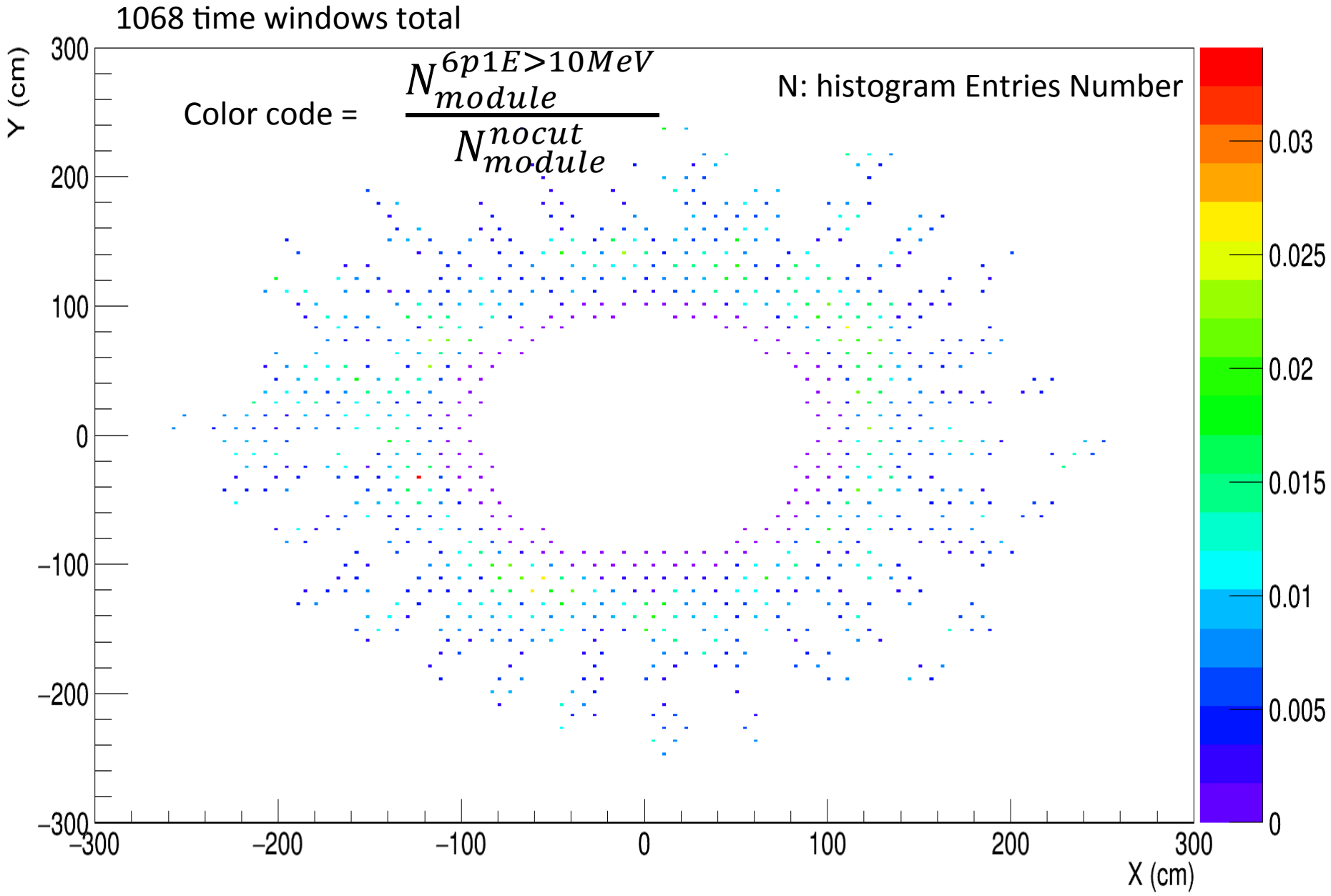








EM only Backgrounds

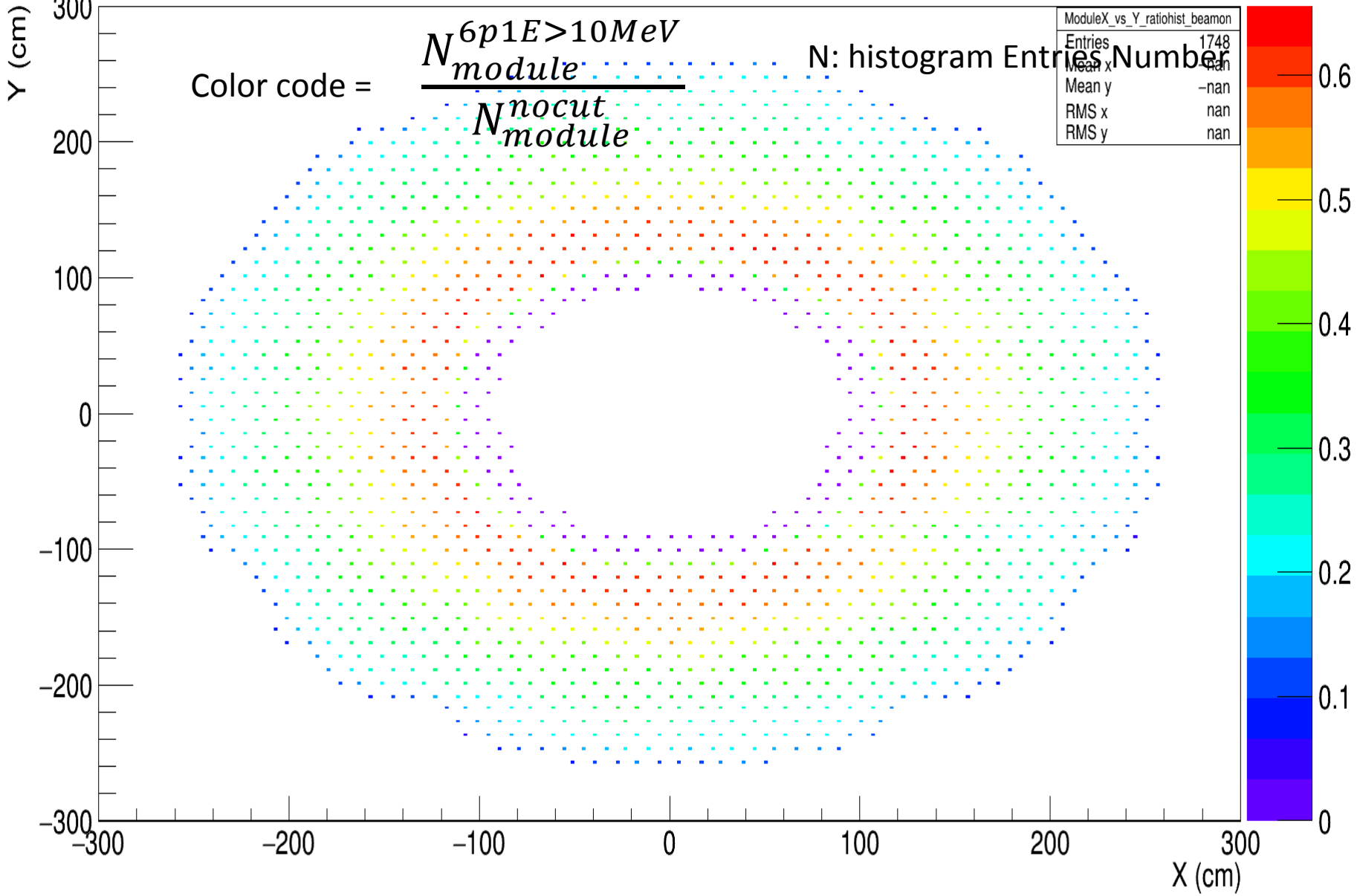


Beam on Target Backgrounds

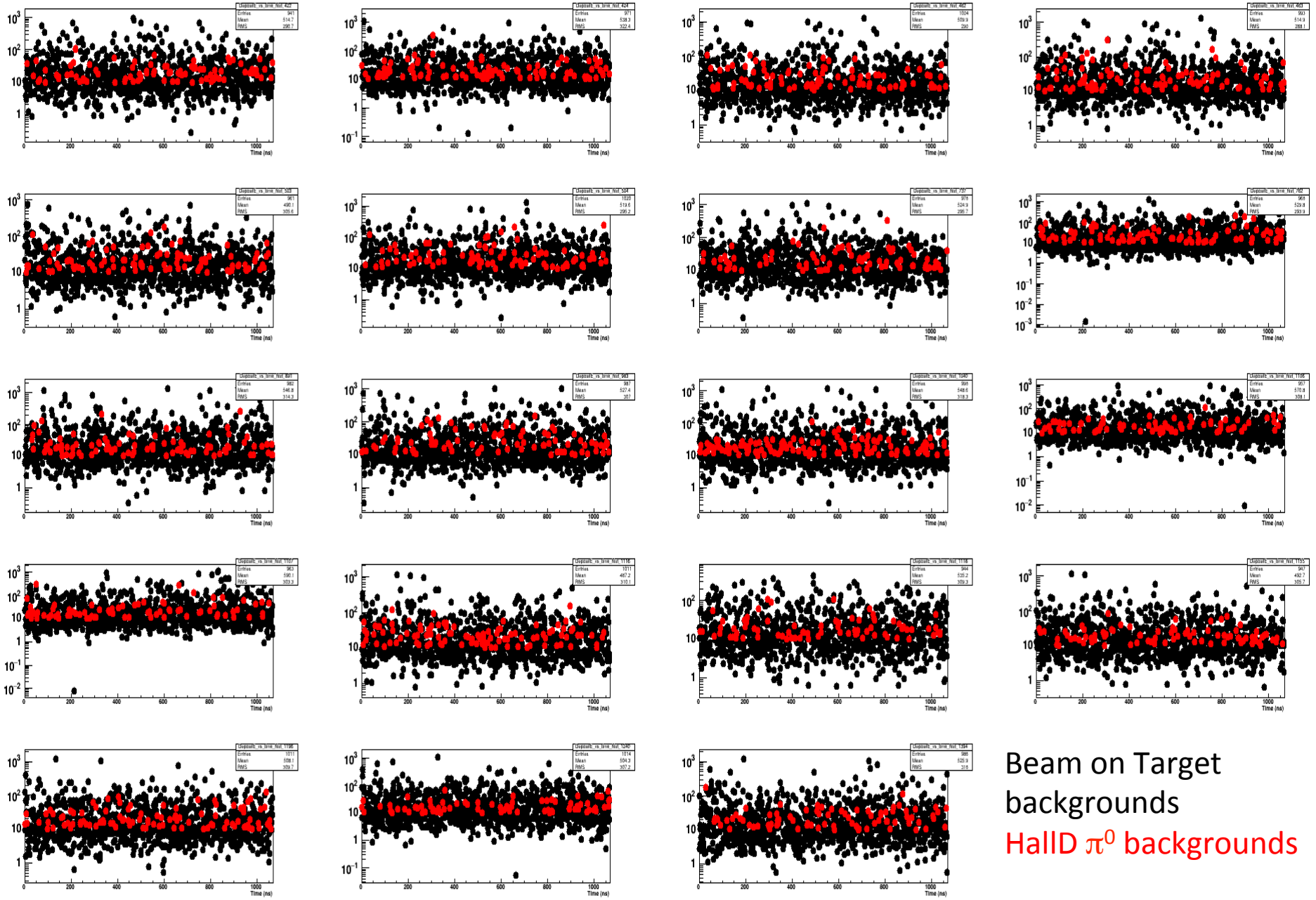
1068 time windows total

Color code = $\frac{N_{module}^{6p1E>10MeV}}{N_{module}^{nocut}}$

N: histogram Entries Number



6p1 Deposit E vs Time Windows for Individual Module



Beam on Target backgrounds

HallD π^0 backgrounds

Summary and Outlook

- The EM background deposit energy from GEMC is much lower than the preCDR results, which is consistent with more time windows simulation data.

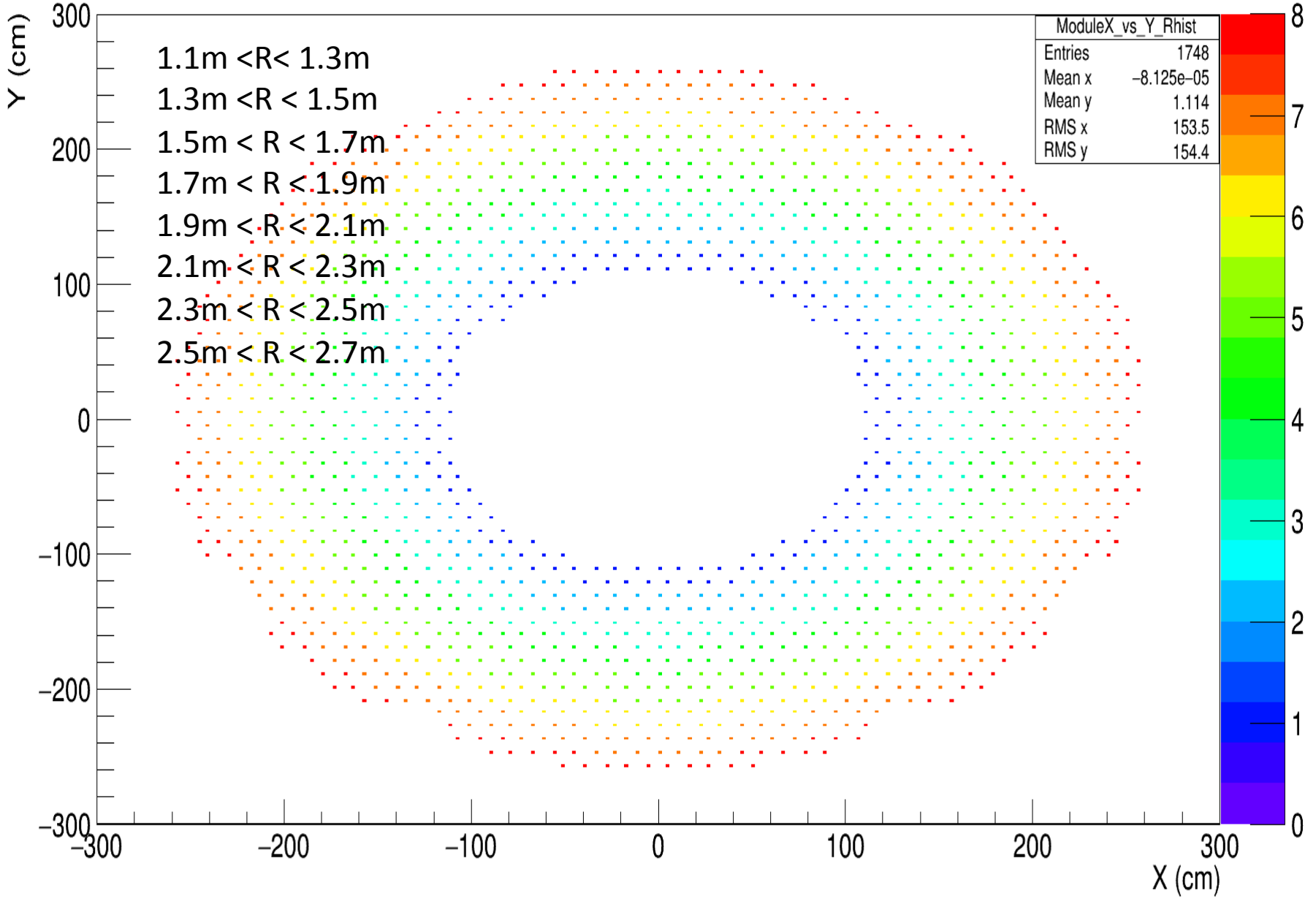
- For the beam on target backgrounds, the new simulated 1068 time windows data show that the contribution from hadron backgrounds is larger. Are 1068 time windows enough for this study?

- Next step, study the E/p cut (e^-/π^- seperation) ECAL module dependently for PVDIS. (separate higher background deposit radius and lower background deposit energy radius).

Any comments and suggestions ?

Back up

Ecal module X vs Y for radius color code



HallD π^0 Backgrounds only for PVDIS