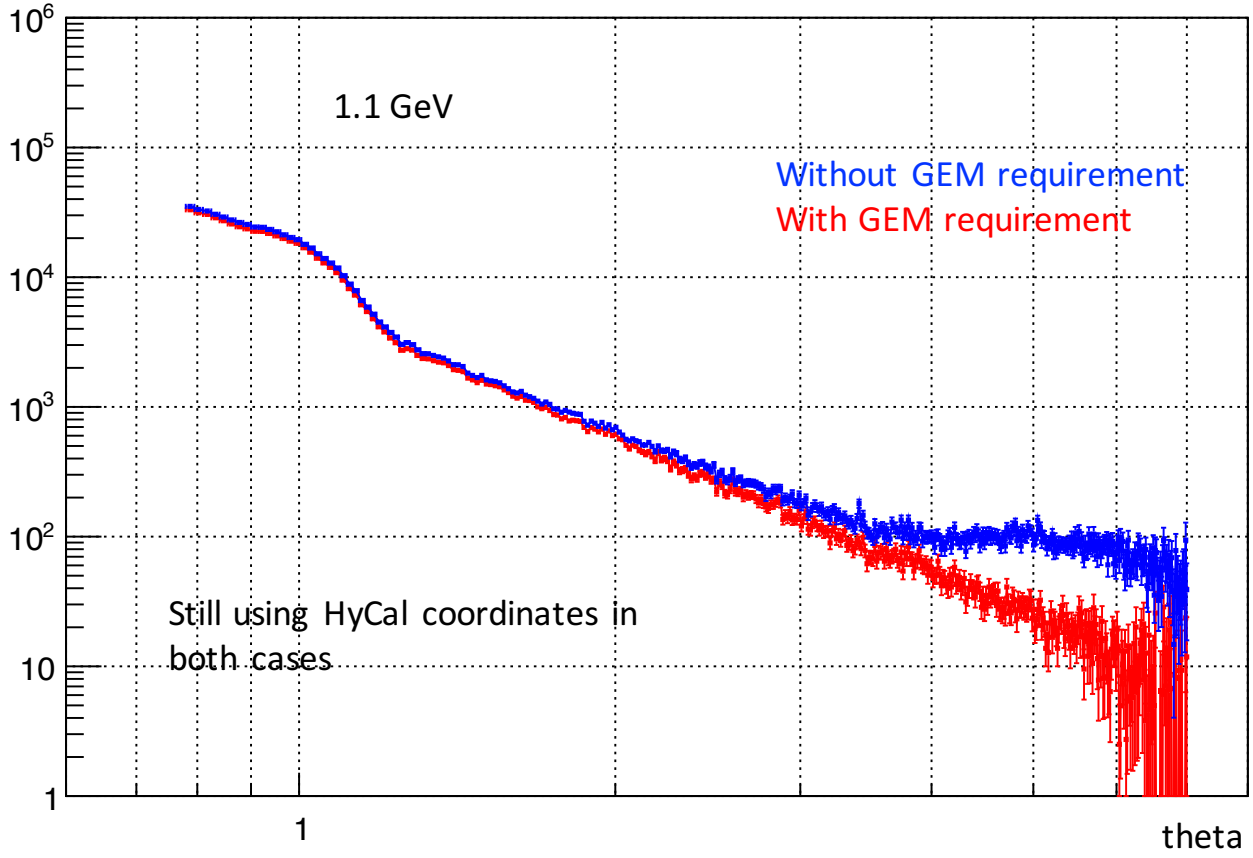
Progress update

- Background study continue
  - Bump at large angle if without using GEM
  - Bump at smaller angle
- Complete list of potential overflow channels

- Update on yield of ep and ee

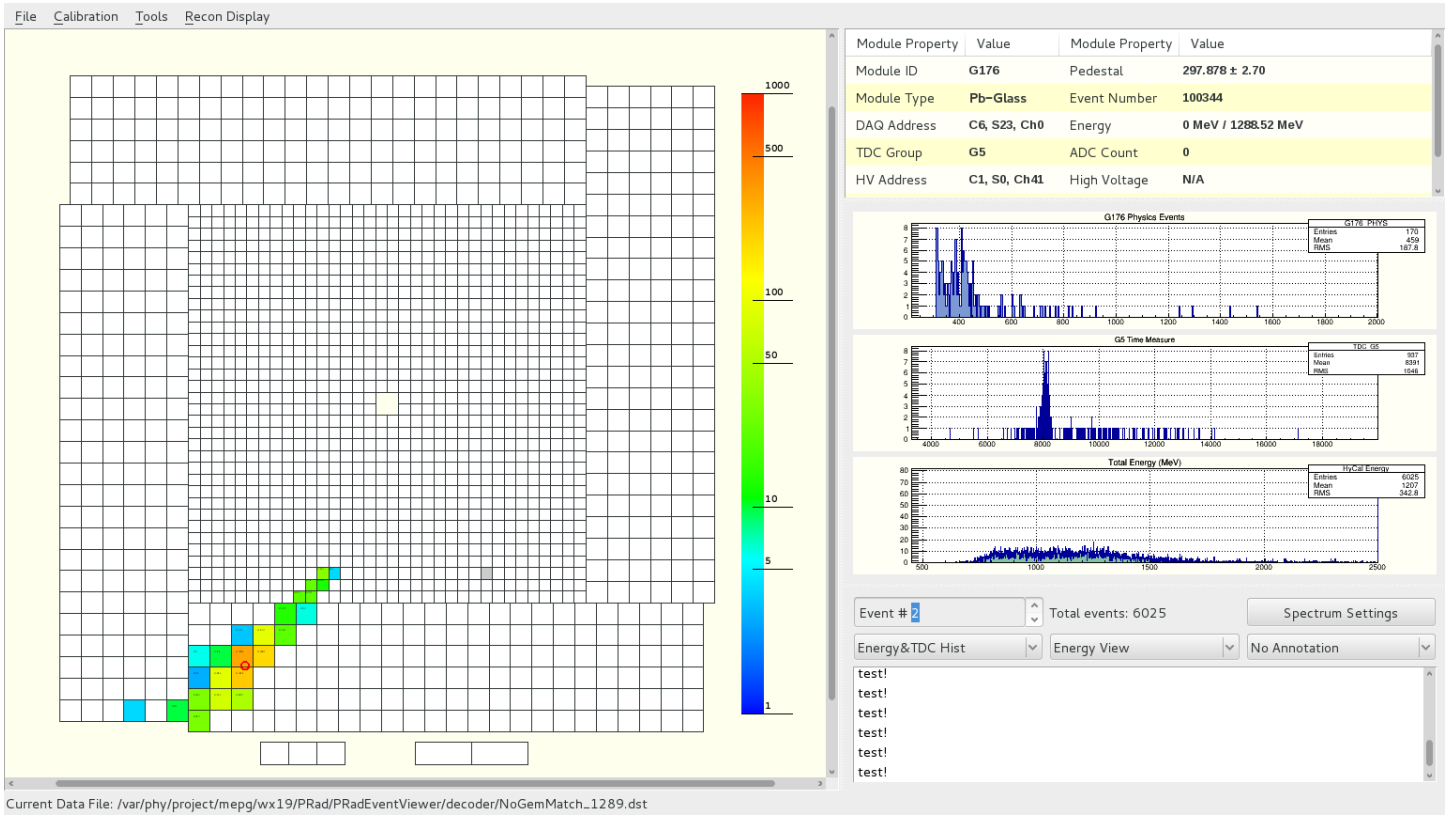
The ep yield vs. scattering angle theta for empty target runs

Graph



Background study

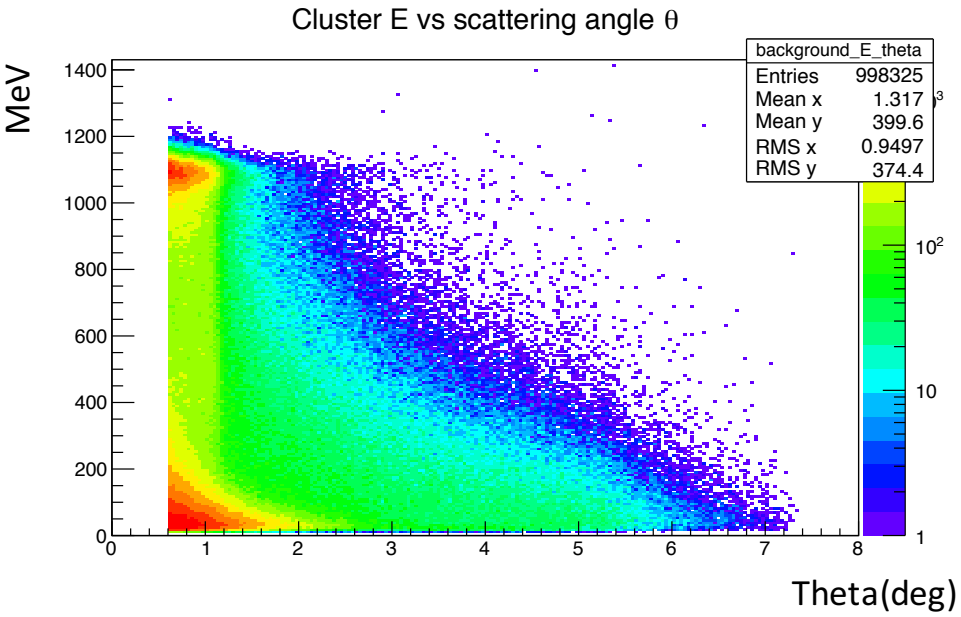
- Select events that satisfy the ep selection criterion but has no matched hit found on GEM
- Check all such events in one run on the event display, see mostly cosmic events



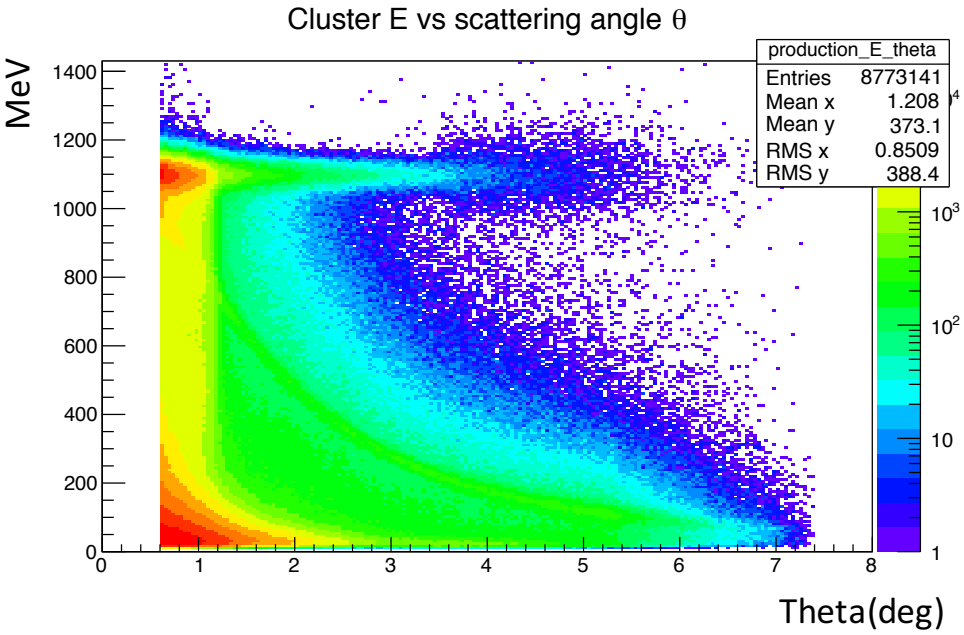
Background study

- For background at small angle, I look at the distribution of empty target and empty chamber runs
  - Only one empty chamber run in the calibration period 5, so statistics is a bit limited

Empty Chamber

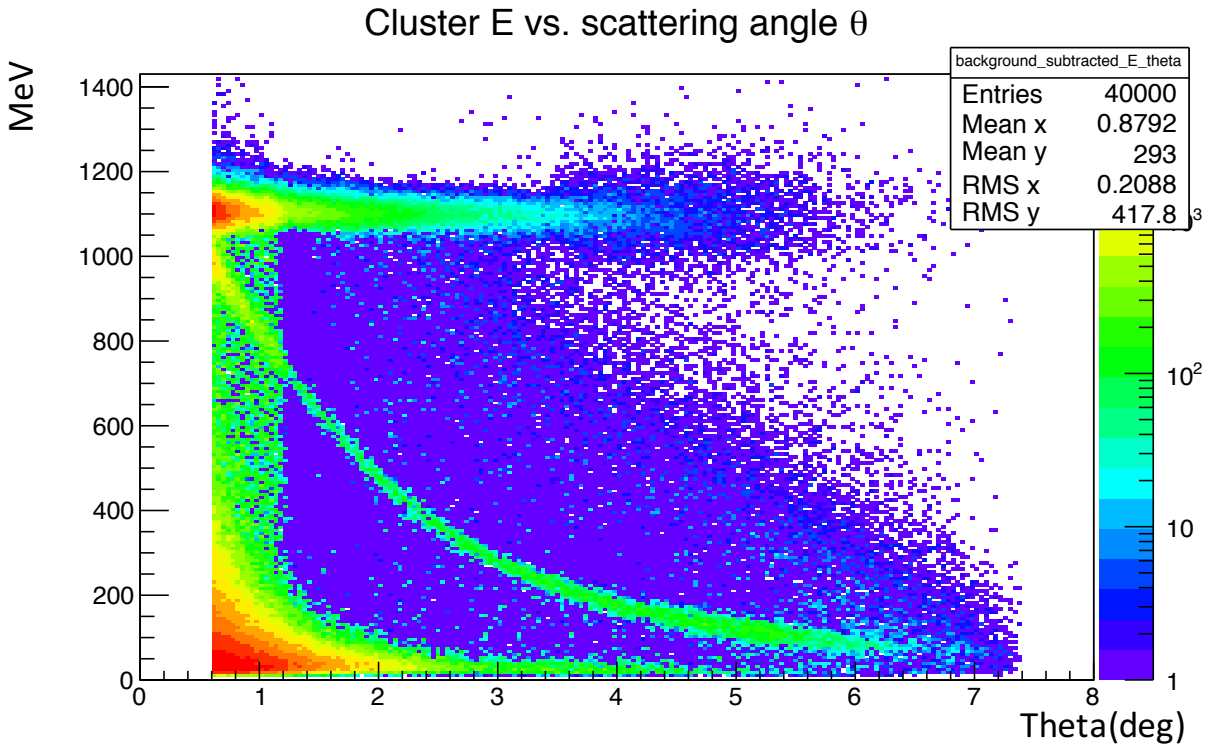


Empty Target



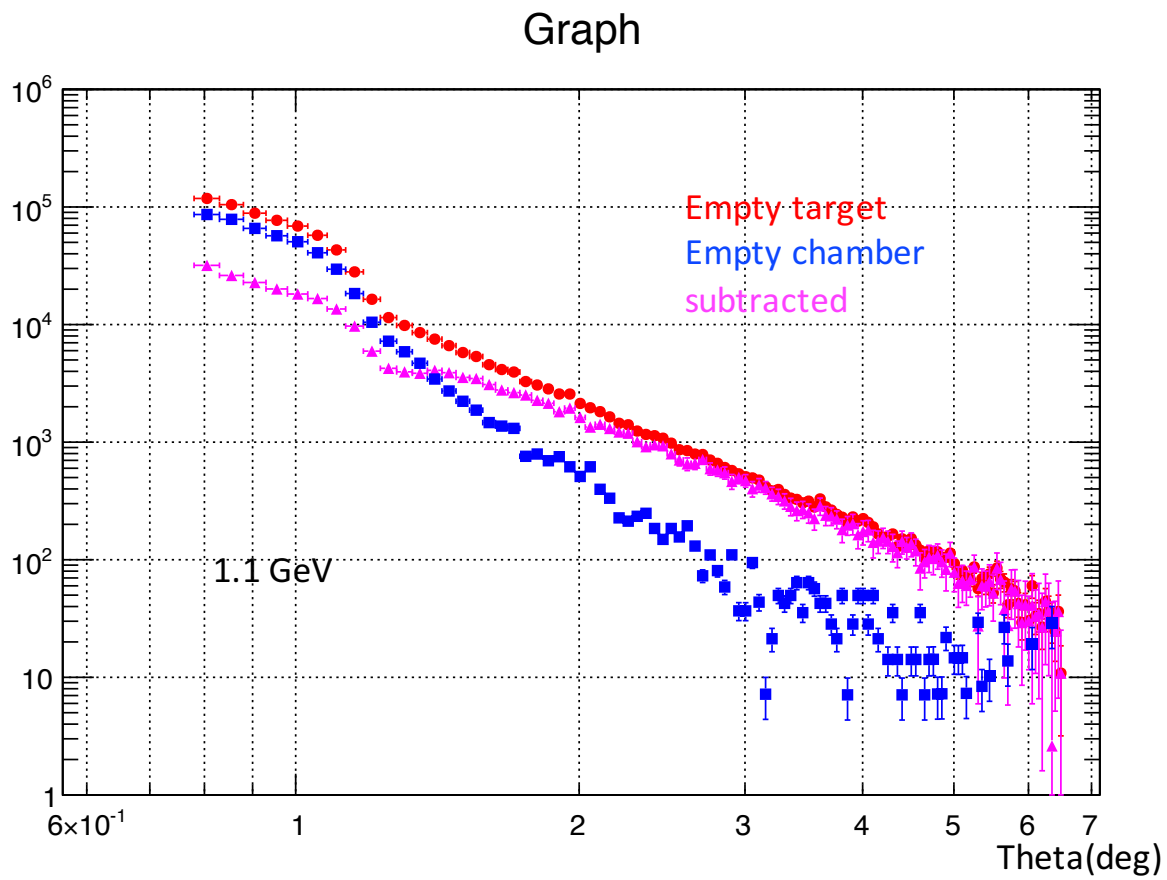
Background study

- After scale with the live charge, and subtract the two histogram we get:



Background study

Selecting out ep events from empty target and empty chamber runs and subtract them bin by bin.
Coordinate using GEM detector



Complete table for potential physics overflow channel

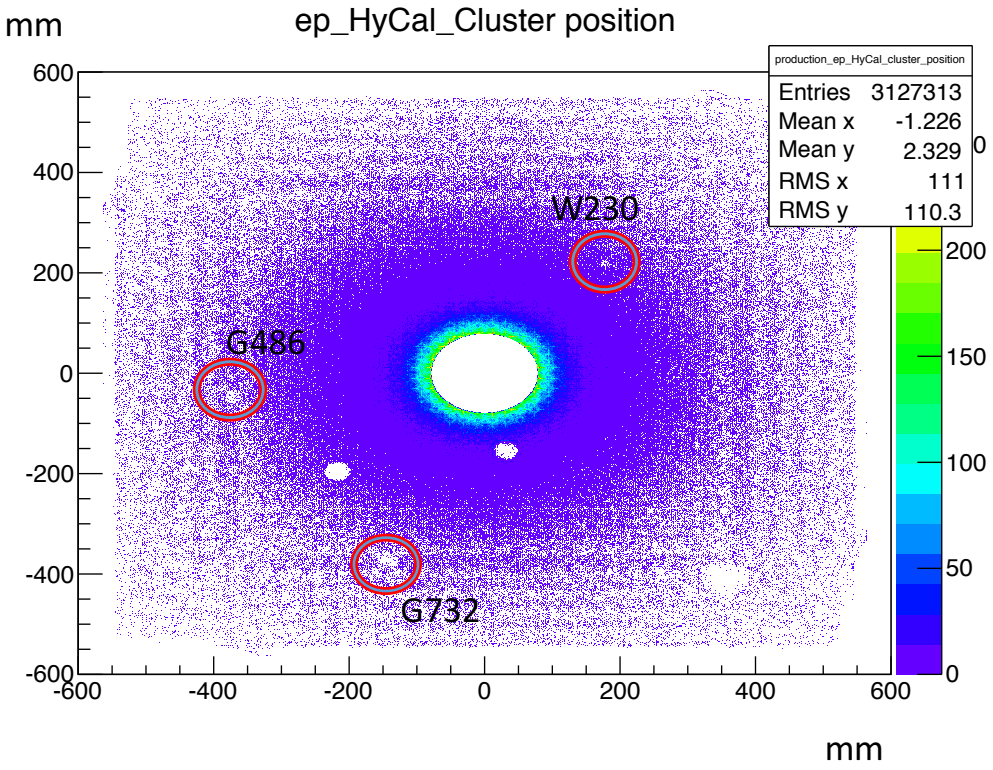
1.1 Gev

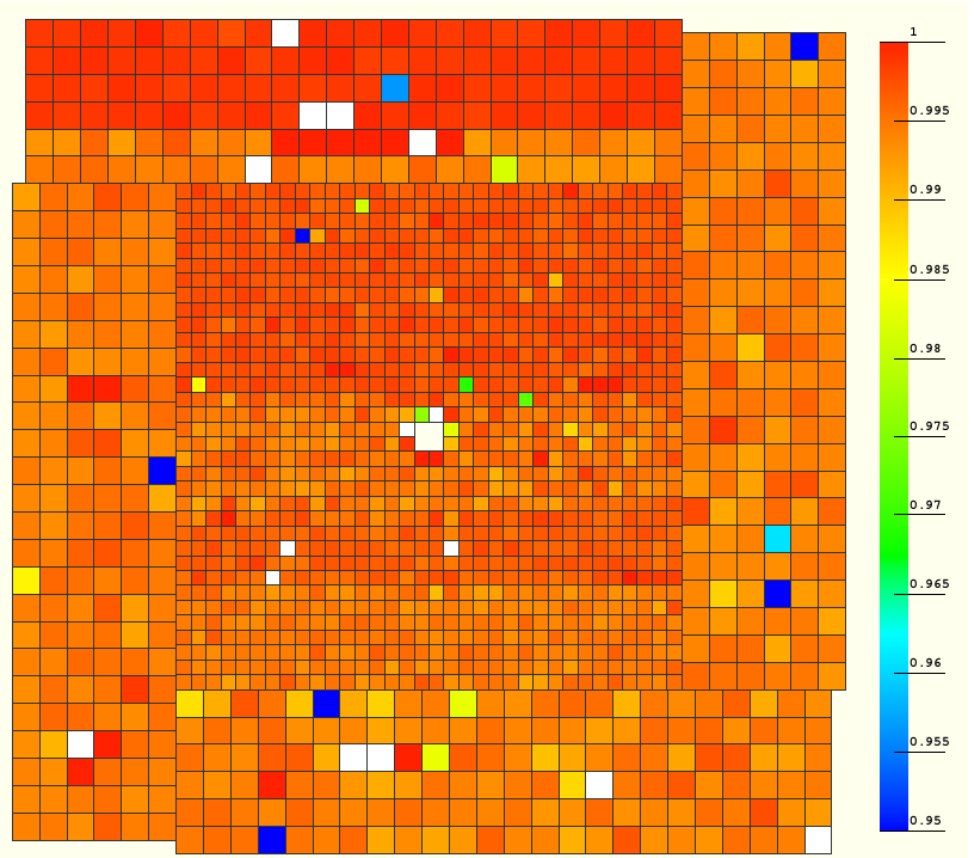
A channel is like has physics overflow when the maximum allow energy is close to 1100 x 0.8 + (27 x 3) = 961 MeV (for 1.1 GeV data)

Channel	Max E allowed	Channel	Max E allowed
W1	940 MeV	W171	911 MeV
W194	782 MeV	W885	909 MeV
W526	742 MeV	W958	967 MeV
W527	766 MeV	W969	775 MeV
W646	923 MeV	W748	960 MeV
W728	921 MeV	W1116	871 MeV

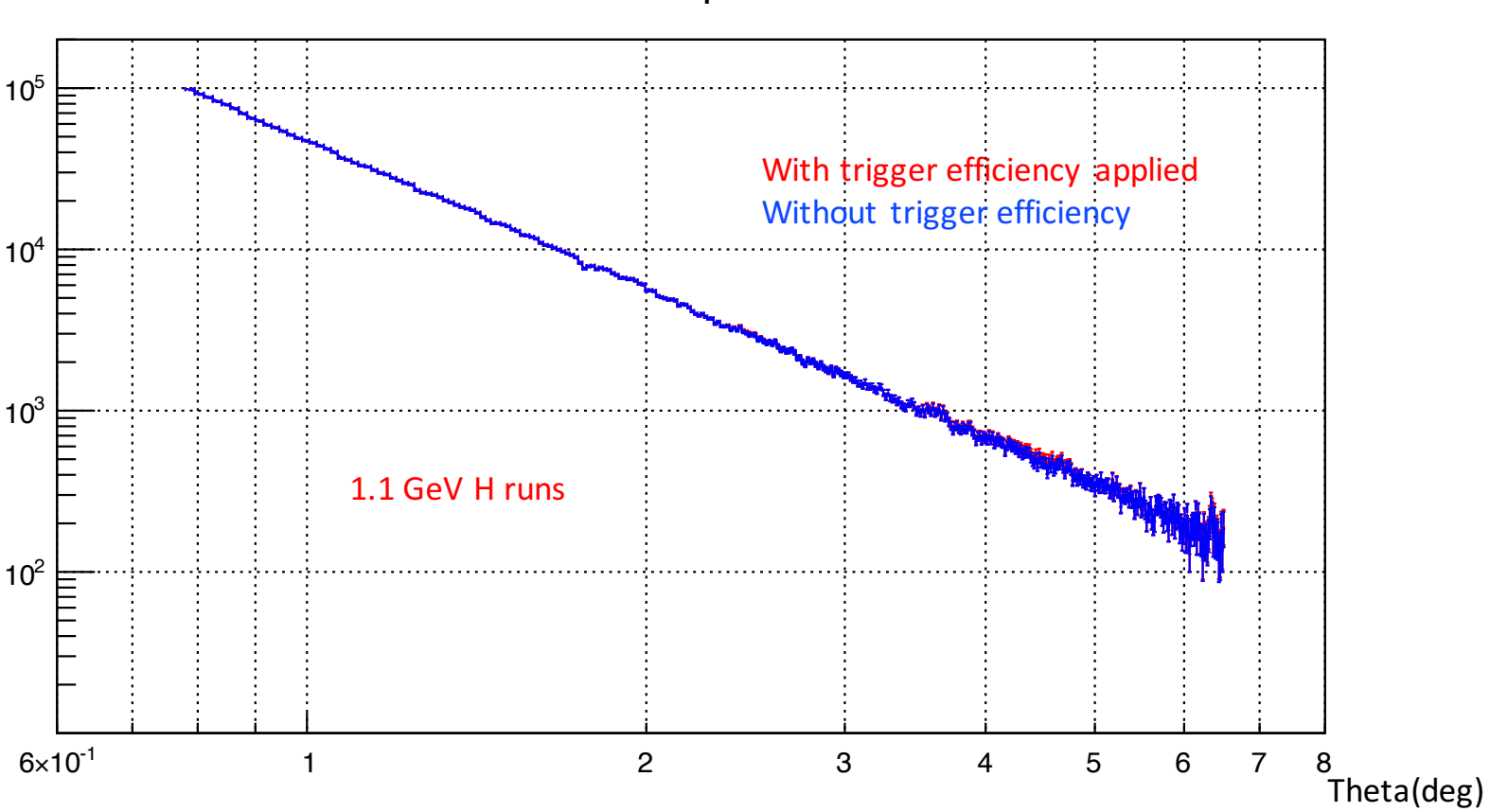
A few Channel has very low ep counts

Trigger efficiency from Maxime



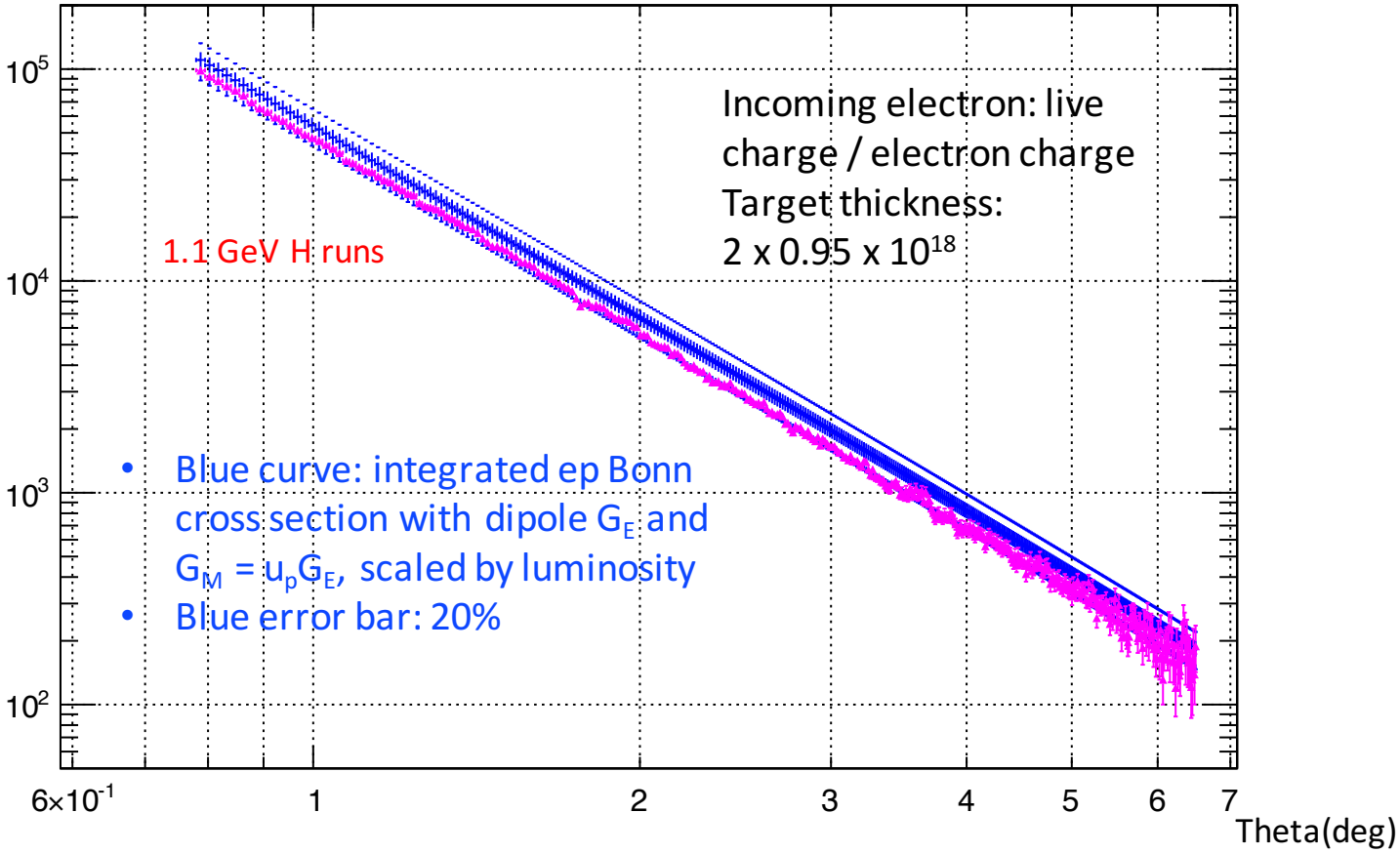


ep yield as a function of scattering angle theta, after background subtraction and using GEM coordinate

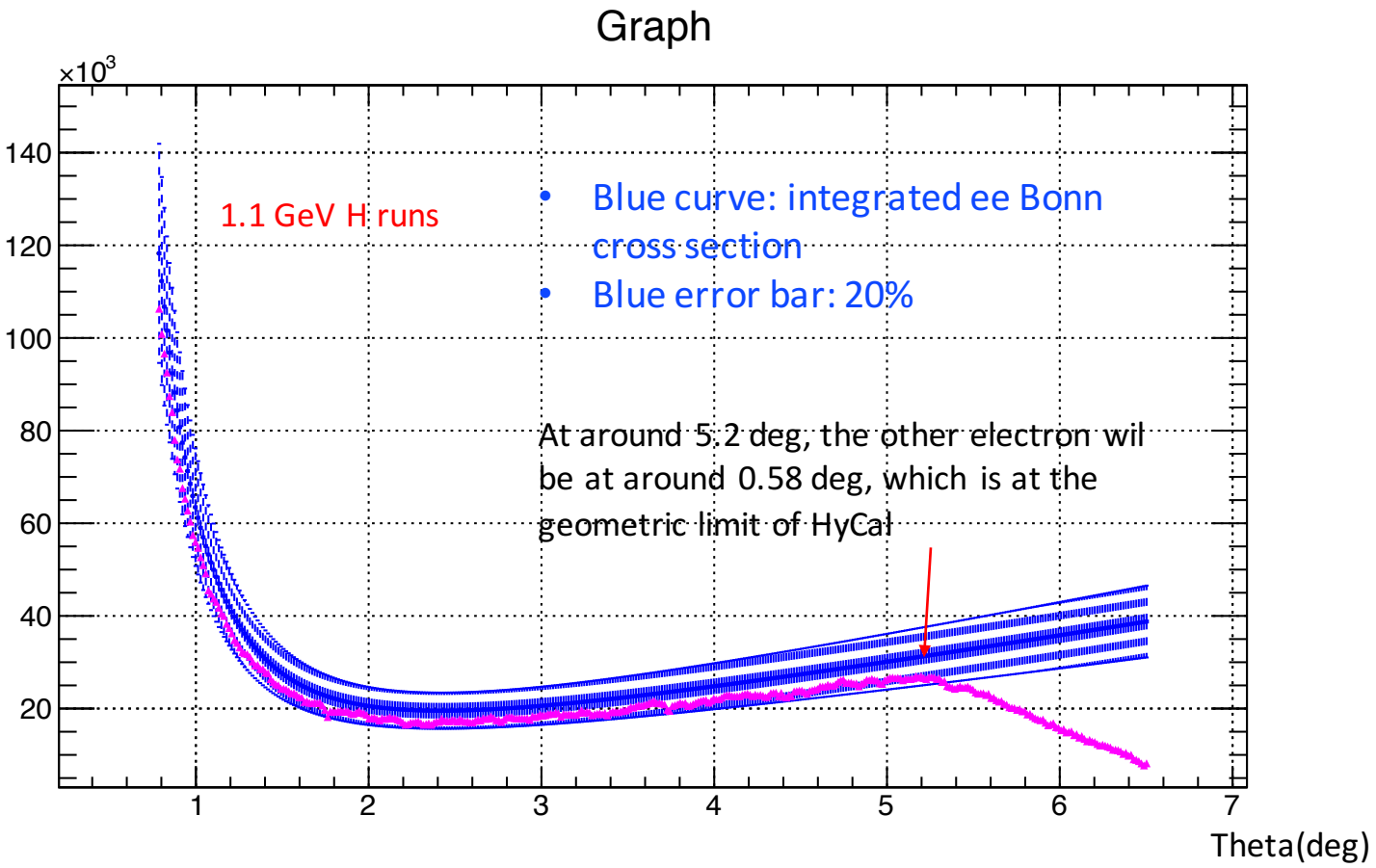


ep yield as a function of scattering angle theta, after background subtraction and using GEM coordinate

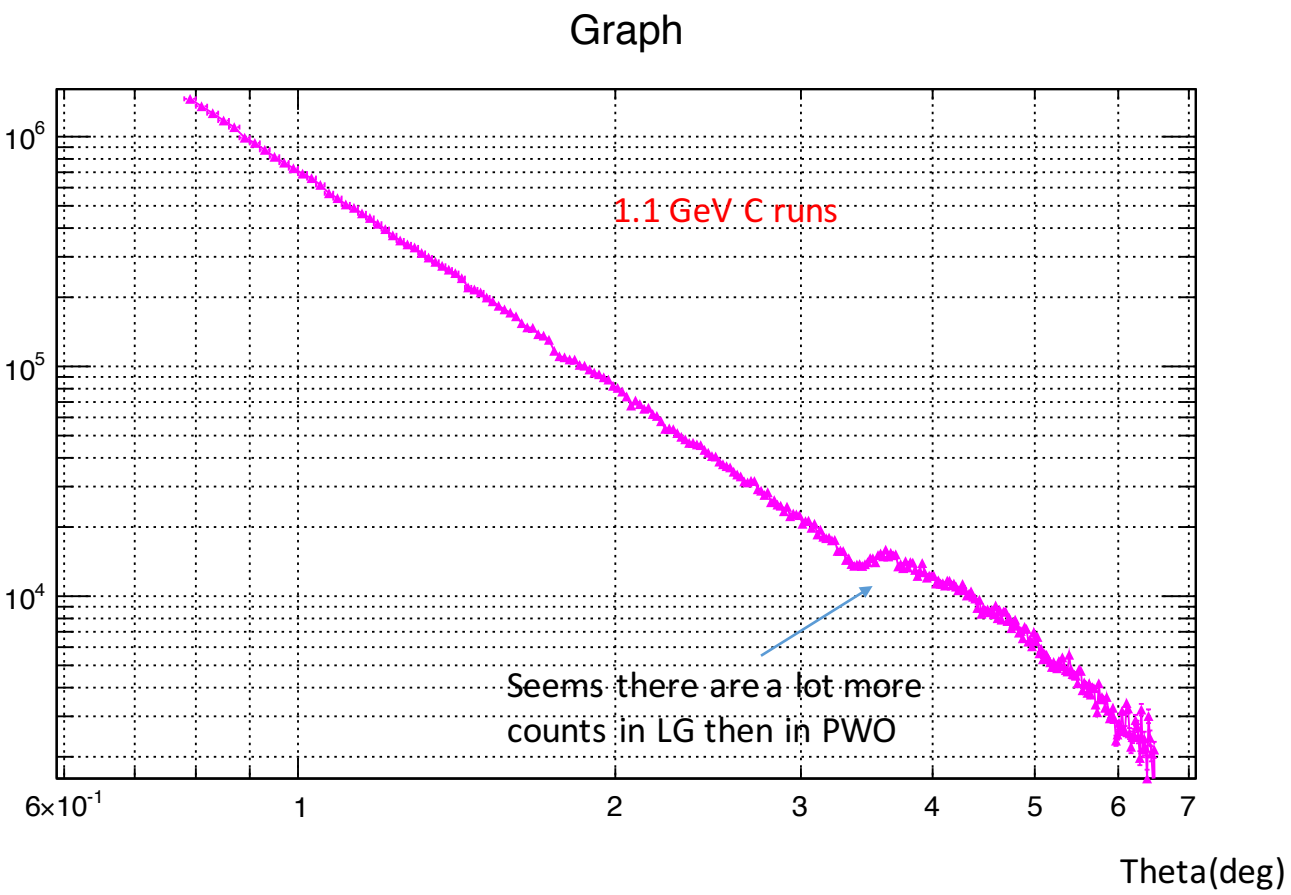
Graph



Single arm ee yield as a function of scattering angle theta, after background subtraction and using GEM coordinate

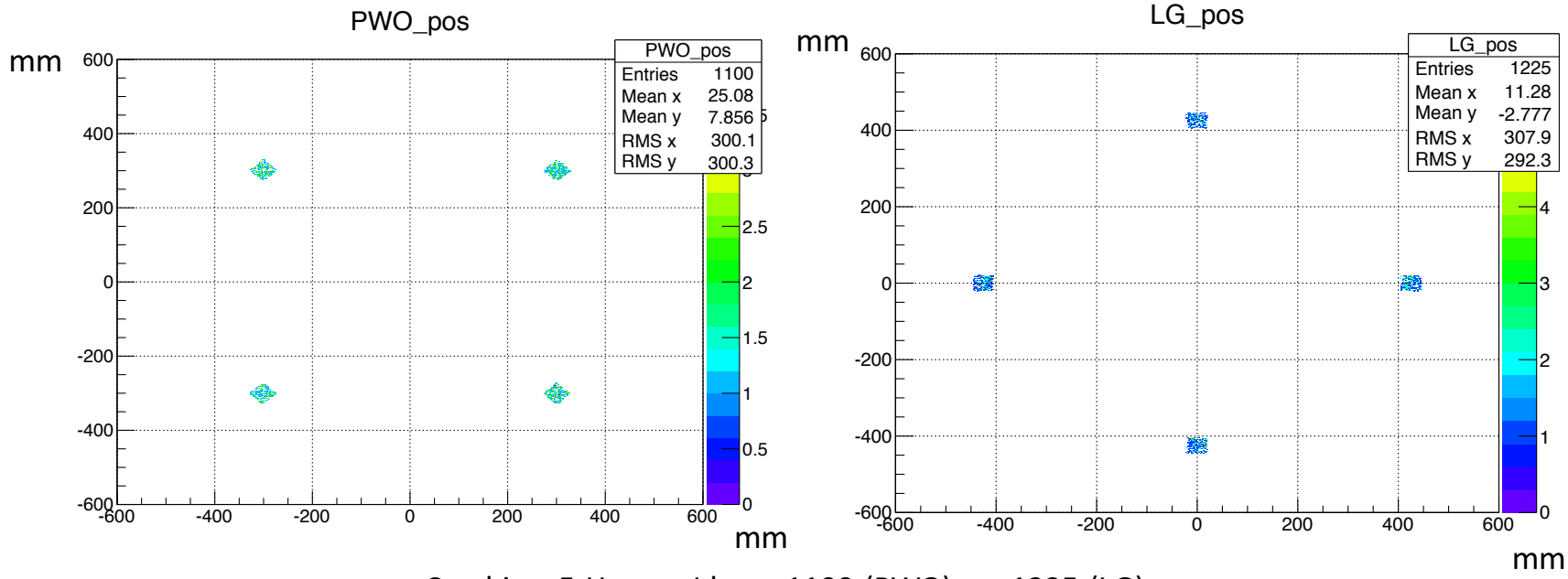


ep yield as a function of scattering angle theta, after background subtraction and using GEM coordinate



Test I

- PWO and LG have certain overlap in azimuthal angle
- Pick ep events landed near the four corners of PWO, and count how many events there
- Rotate the above region of interest by 45 deg, so that they are now in LG region, count the number of ep events there
- Due to azimuthal symmetry, the counts should be the same

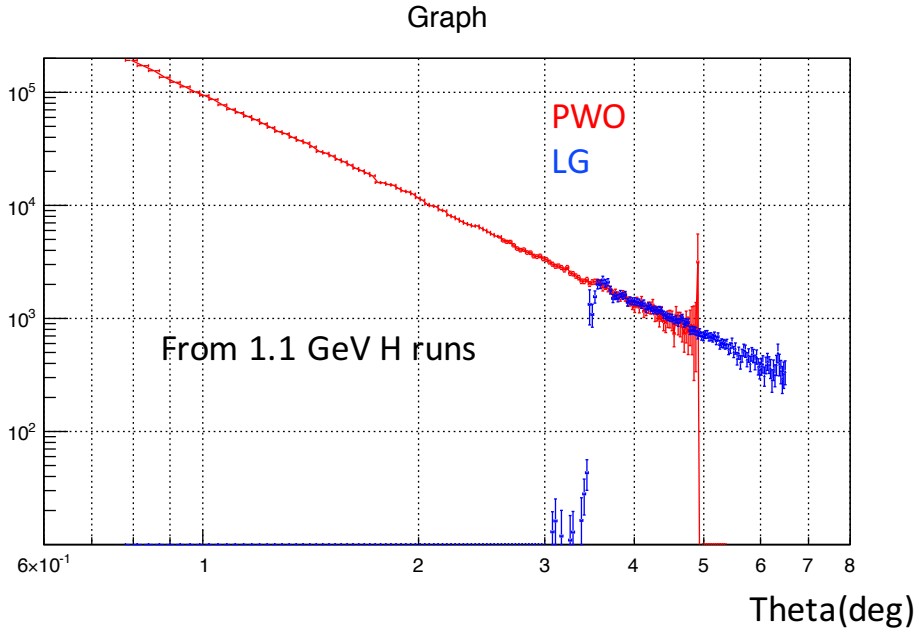


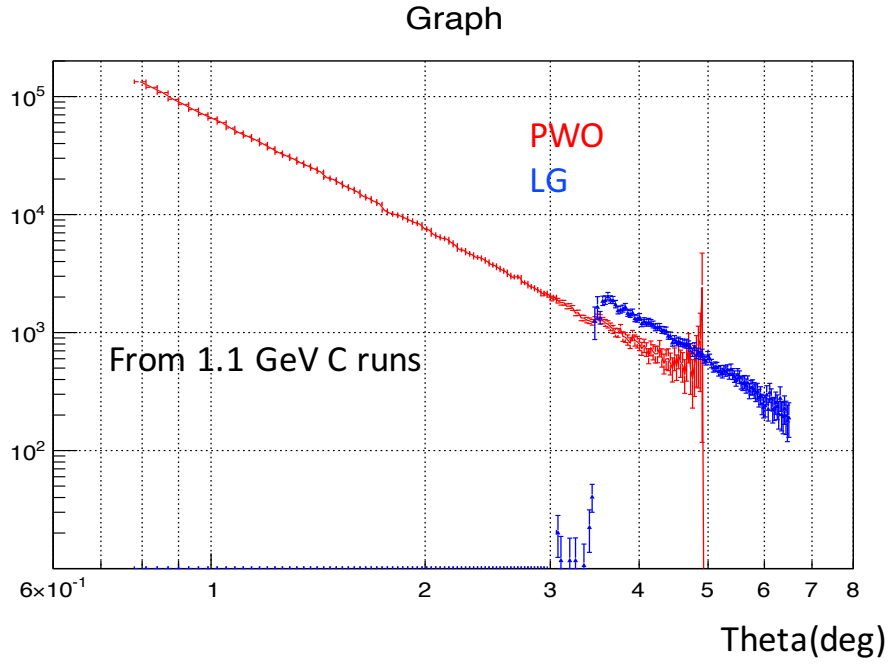
Combine 5 H runs, I have 1100 (PWO) vs. 1225 (LG)

From Carbon run, I have 491 (PWO) vs. 956 (LG)

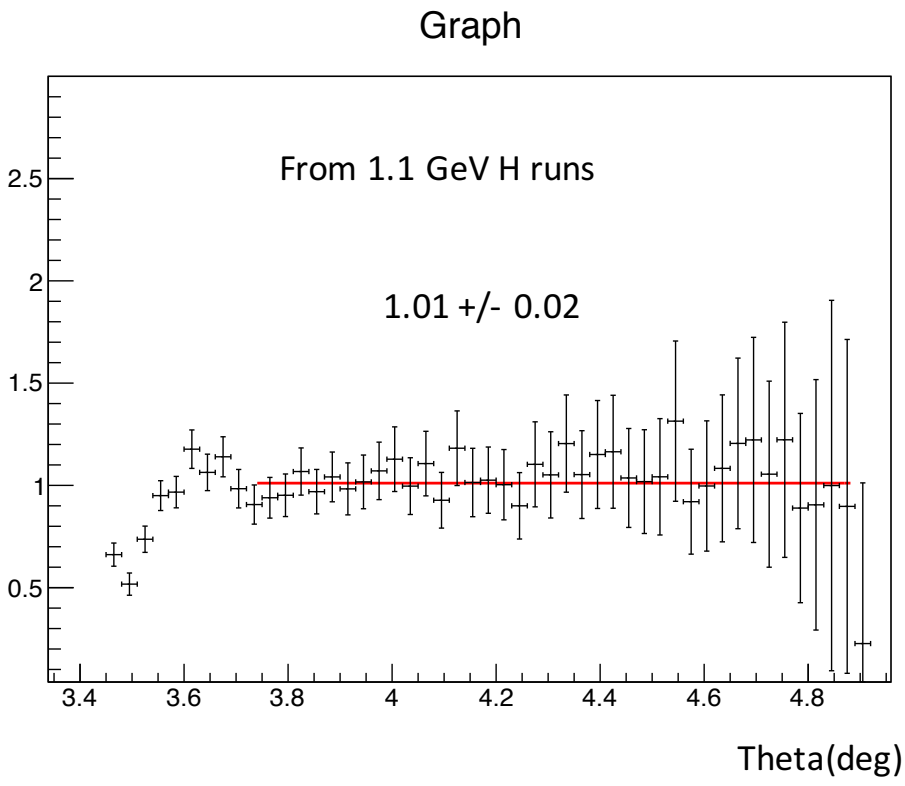
Test I

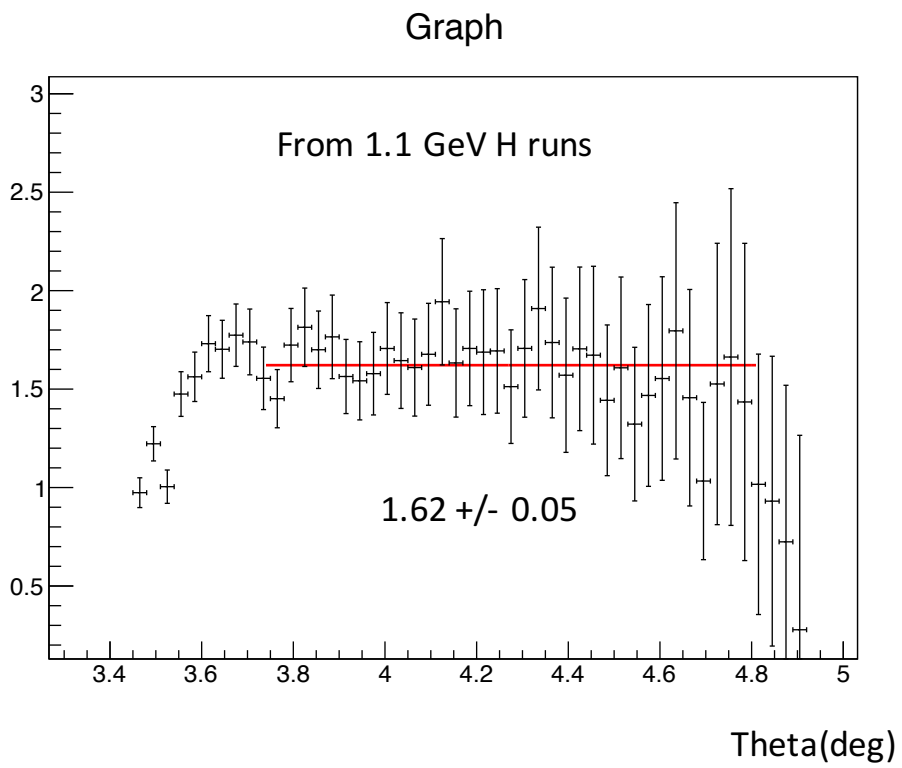
- Completely separate ep events in PWO and LG, after rough correction on the geometry acceptance of PWO and LG separately, see if they agree with each other over the overlap region in phi
  - Using CID to judge whether it is a PWO or a LG cluster
  - Using GEM coordinate



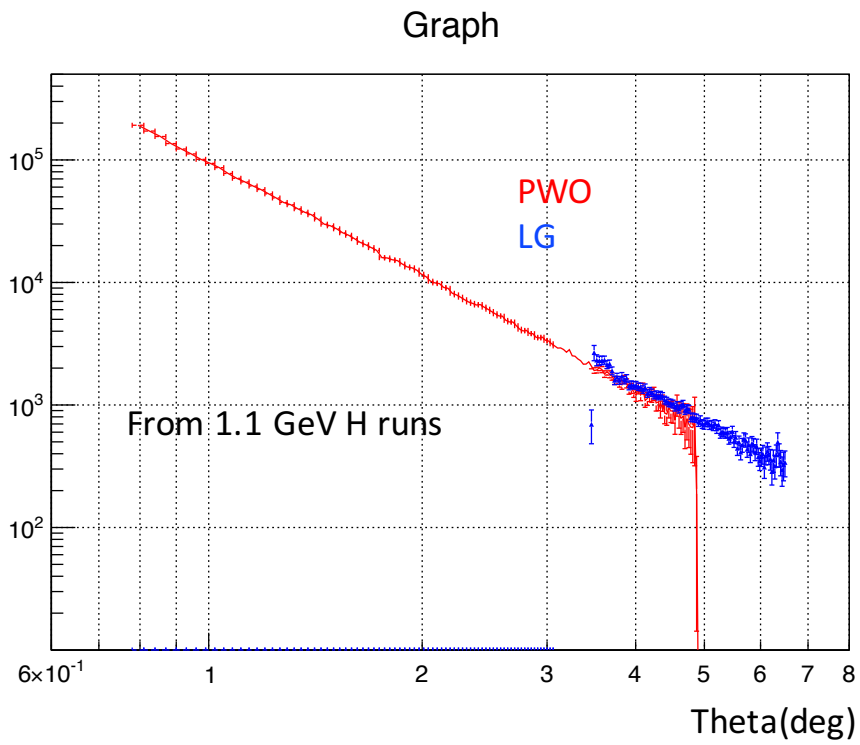


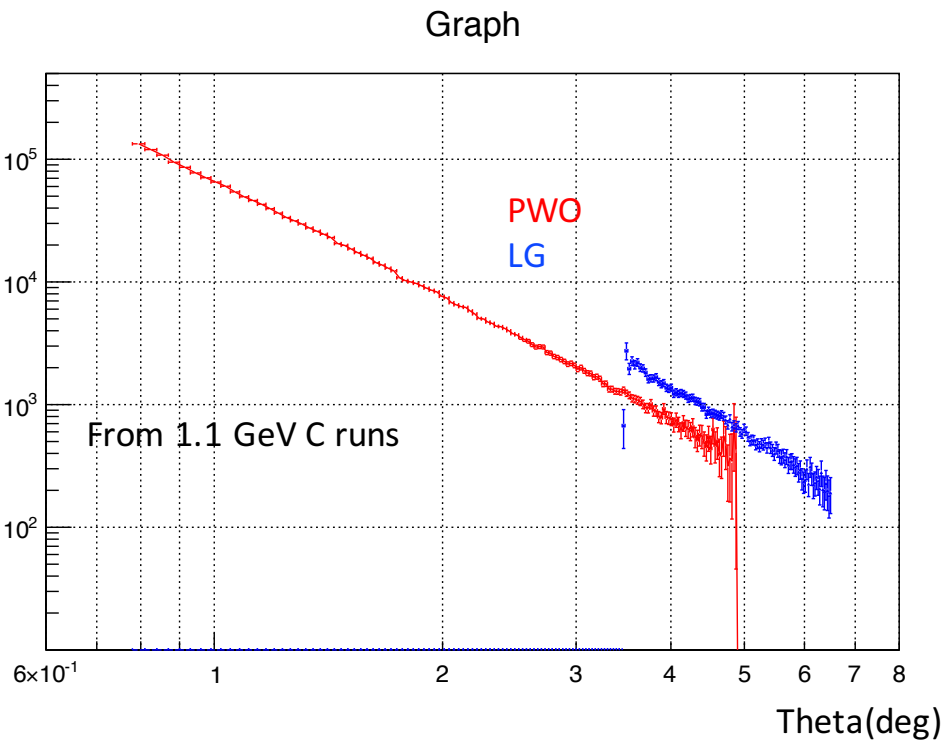
Ratio of LG ep counts over PWO ep counts after geometric acceptance correction





If using GEM projected coordinate to judge whether it is a PWO cluster or LG cluster





Agreement at the overlap region not as good as using CID, one possible reason might be the relative z distance between GEM and HyCal