

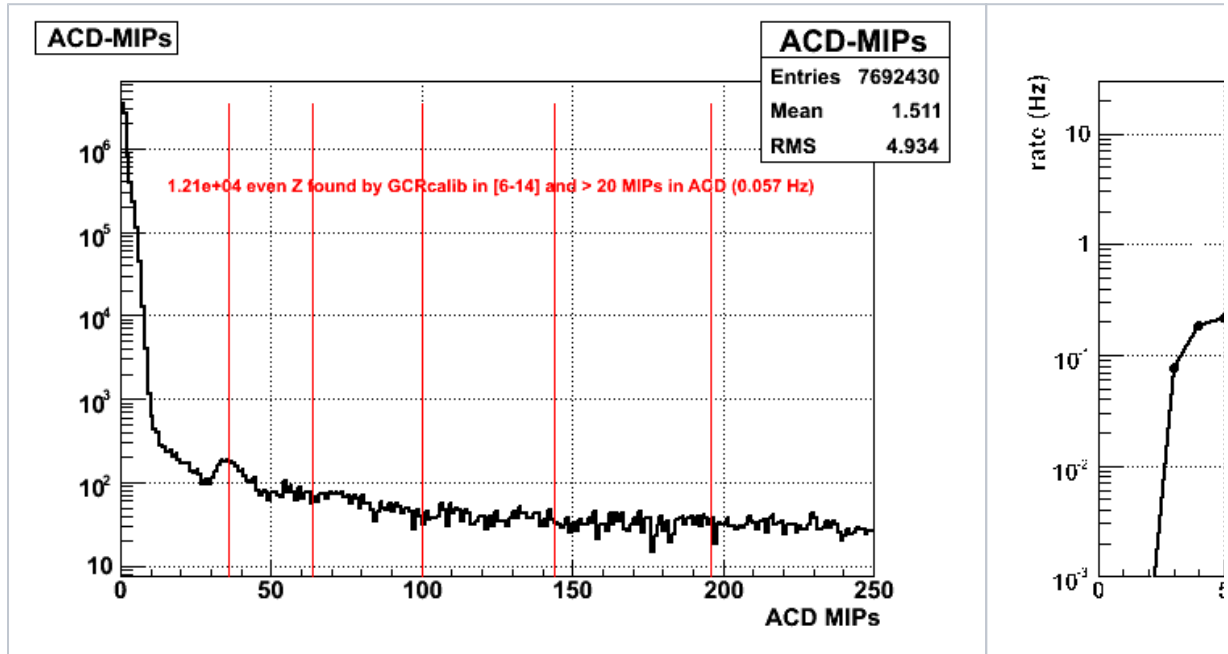
01 Apr 08 GCR Meeting Notes

- LPTA

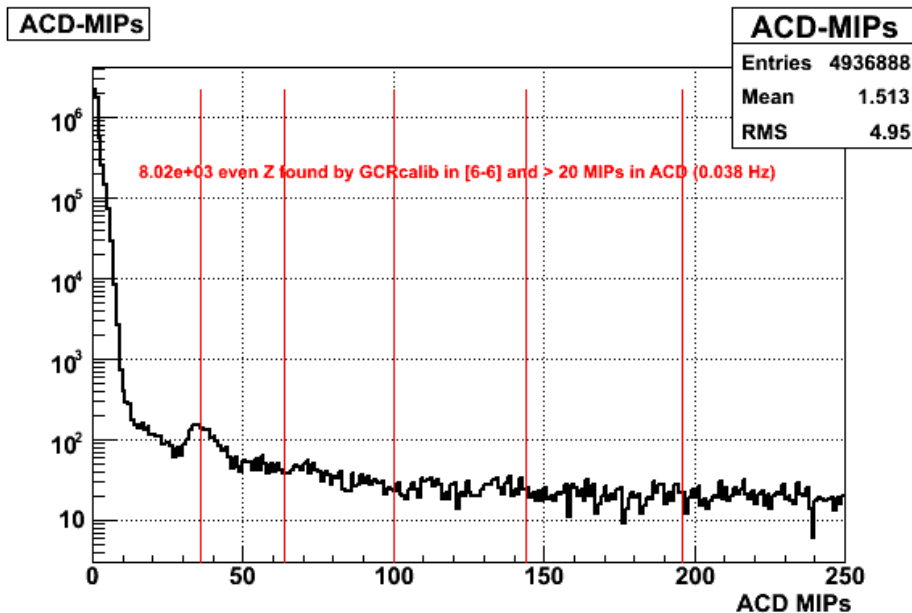
- Can GCRcalib help to calibrate ACD HI charge scale? (Fred)

Following the presentation of last week, I analysed 50 runs of opssim2 data. The collection time is 70h (effective duration of 60h).

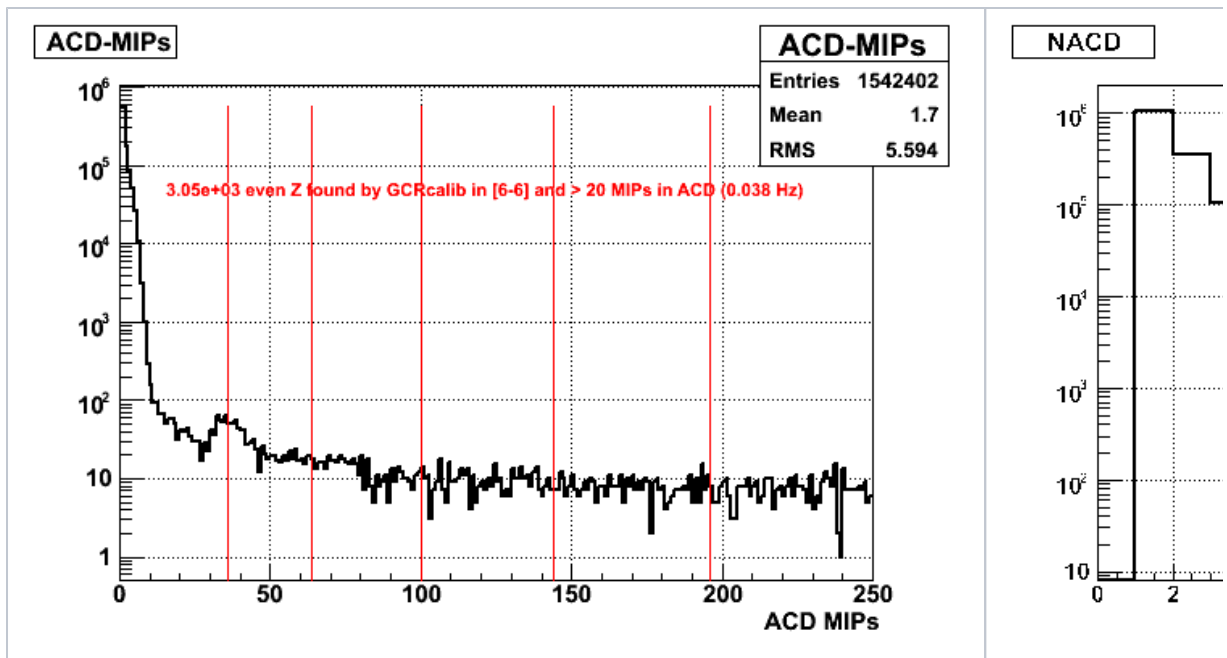
For each event where GCRcalib found an even value for the atomic number in the range 6-14 (i.e. C, O, Ne, Mg or Si), I loop on the AcdTrkHitPoca list in ACD recon. For those hits which have a suitable DOCA to Tkr1 track (doca>50mm, i.e. Tkr1 track within 50mm of the tile), I get the number of MIPs from the AcdHit collection. This is a very slow analysis (8h30 to analyse 50 runs!). The following plot in the left panel shows the obtained MIP spectrum, combining all ACD tiles: the red vertical lines are at positions 36 (C), 64 (O), 100 (Ne), 144 (Mg) and 196 (Si).



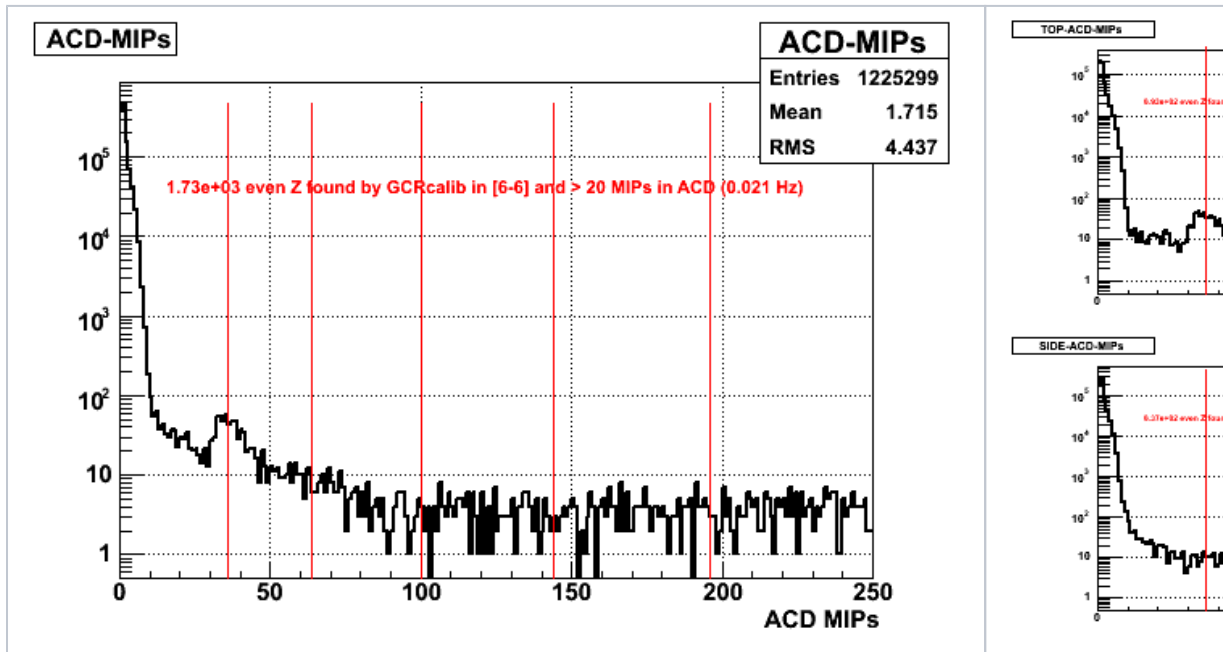
Only the carbon peak is visible. The rate of events above 20 MIPs is 0.06Hz, thus really lower than the ~1Hz of GCRcalib throughput (see right panel). The plot below shows the same spectrum restricted to carbon events. The carbon peak is a bit more pronounced, but still there is less than 1000 hits in all tiles under this peak.



As a last check, I analysed a sub-sample of 20 runs from the opssim2 simulation, taking only the hit with the highest MIP value in each event. The following spectrum (left panel) shows that the carbon peak is not more pronounced with respect to the peak below 10 MIPs and to the background above this value. The rate of events above is almost the same (about 0.038Hz), which can be explained by the fact that the number of poca associated to Tkr1 track in ACD recon is 1 most of the time (right panel distribution).



Finally I used the tighter cut $\text{doca} > 0$ which gives the following spectrum (left panel):



This cut change removes a little bit of the peak below 10 MIPs, and a large fraction of the background at higher values. The spectra on the right panel are for the top tiles (top spectrum) and side tiles (bottom spectrum): the carbon peak has a better peak-to-valley ratio for the top tiles, and it is not visible at all for the tiles on the sides of the ACD.

- NRL
 - Comparing, monitoring and trending GCR rates and calibration results (Zach, Fred, etc)