

CAL calibration monitoring with GCRs

Brief overview of the codes

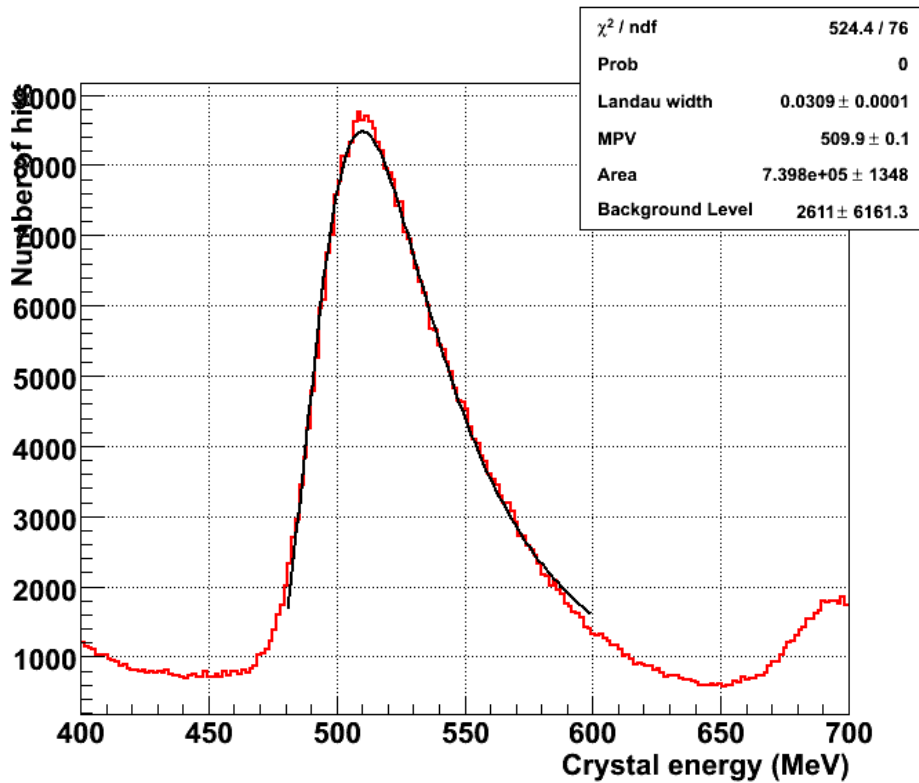
gcrMake

- compiled code – usually run on noric or SLAC farm
- input: list of gcr and merit file locations in XROOTD
- output: ROOT file with filled histograms and text file with event rates
- easy to implement any other analysis (e.g., CNO events through ACD tiles)
- same code runs on data AND simulations

gcrHistos

- interactive code based on a single class, "GcrHistos" (the same used by gcrMake to fill histograms)
- input: ROOT and ascii files produced by gcrMake
- output: histograms arranged in panel, fit results, calibration accuracy
- fast (loop on events is already done by gcrMake)
- easy to use: one can zoom in any particular channel, layer, tower etc.
- modular: one can add different data sets

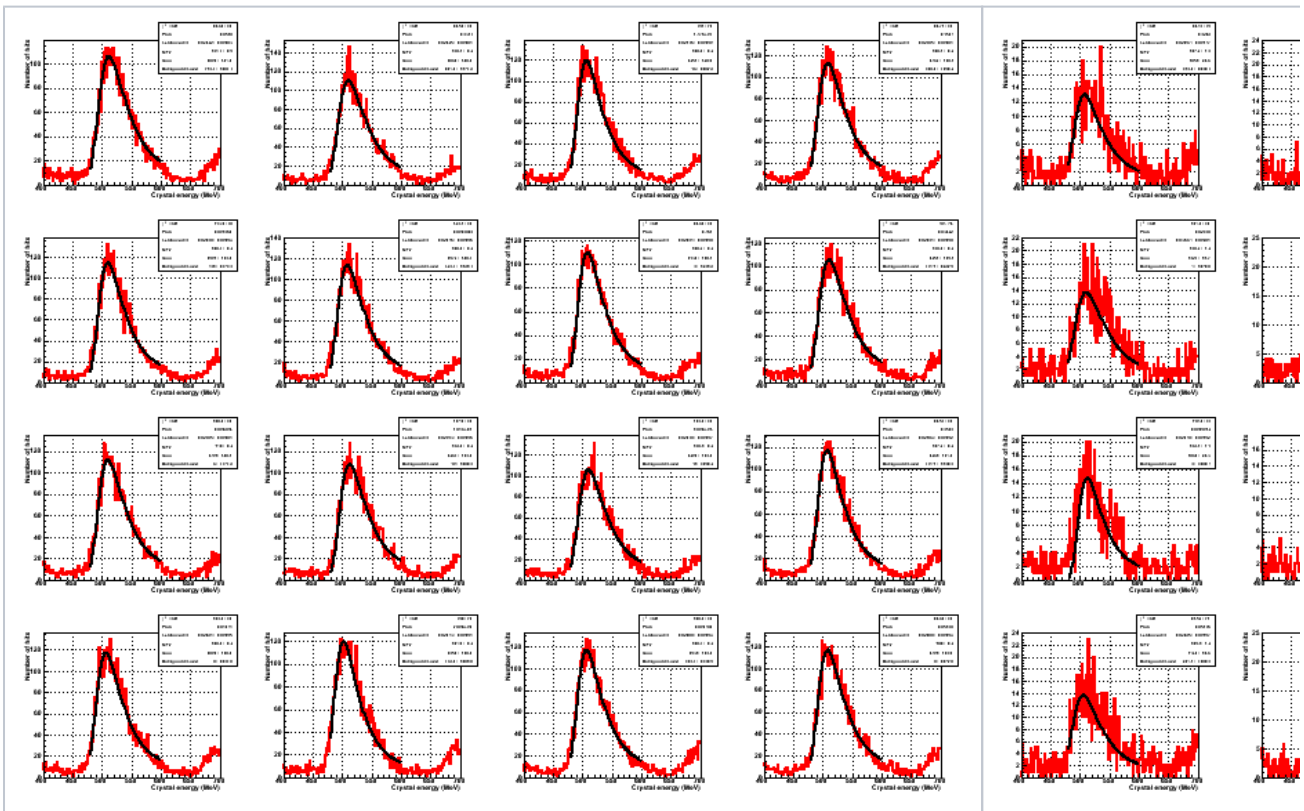
```
root [0] .L gcrHistos.cxx
root [1] g=new GcrHistos("gcr_nomSciOps_noSkirtCno_noCno");// opens the file and reads the histograms
<><><><> opening filename=titi/gcr_nomSciOps_noSkirtCno_noCno.root
<><><><> reading histograms
<><><><> BuildRates
<><><><> BuildEvents
<><><><> BuildHits
<><><><> BuildEngine4TopAcd
<><><><> BuildMs
<><><><> BuildPeaks
(class GcrHistos*)0x97efa88
root [2] g->ShowEvents(); // shows event-based distributions:nb of TKR triggering towers, OBF status
word, nb of hits/event
root [3] g->ShowHits(); // shows hit-based distributions:path-length, raw and corrected energy spectra
root [4] g->ShowEngine4TopAcd(); // shows the results of the study on CNO events vs. ACD tiles
root [5] g->ShowMs(); // shows the distributions characterizing the multiple scattering of protons
root [6] g->SumPeaks(); // sums up log histograms to build layer, super-layer, tower, and whole CAL
histograms
root [7] g->FitAllPeaks(1); // fits all carbon ("1") peaks with Landau distribution
root [8] g->ShowPeakPanel(1, "CAL"); // displays carbon ("1") fit histogram for the whole CAL
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root [9] g->ShowPeakPanel(1, "LAY", 0); // displays carbon ("1") fit histograms for the 16 layers in
super-layer 0
root [10] g->ShowPeakPanel(1, "LAY", 7); // displays carbon ("1") fit histograms for the 16 layers in
super-layer 7

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root [11] g->ShowPeakPanel(1, "TOW", 5); // displays carbon ("1") fit histograms for the 8 layers in tower 5
```

