

GlastRelease v13r13

Run Manager Summary

System Tests v13r13

System Tests Summary

The release includes changes to many packages, but many of these are minor bug fixes and updates.

The system tests show a some changes in a few plots relating to the CAL for all tests, but many differences for the background mix. It appears that the MC generation of the background has shifted the generated populations around. This has also caused minor differences in various ACD and TKR plots. A fix to the CAL "ideal" calibration code used by the system tests shifted the gains slightly. This has the consequence of changing the filter energy difference, or Filter Energy - CalEnergyRaw (the OBF uses FSW calibrations), and the CAL plots due to both the shift in calibrations and the interaction with crystal suppression.

Changes

- CAL - fixes and updates relating to CalXtalResponse and ideal calibration code
- Celestial sources - several fixes and updates
- Misc. updates relating to use of CEL (C? event lists)
- No changes to OBF
- No changes to ACD
- Minor changes to TKR
- Minor changes to Trigger
- Misc. other minor fixes and updates, e.g. updates to Pass 6

Changes in simulated background mix

Updates to celestialSources and CRflux have produced minor changes in the simulated particle distribution generated for BackgroundMixDC2 test.

Here are the generated background stats for v13r13 vs. v13r12.

```
+++++
v13r13
+++++
FluxAlg          INFO Computed Rate: 131296 Hz
                Source ID   Source Name           counts
                    0   CrProtonPrimary           6090
                    1   CrProtonReentrant          1460
                    2   CrProtonSplash             1378
                1000   CrElectronPrimary            49
                1001   CrElectronReentrant          6553
                1002   CrElectronSplash             6409
                2000   CrPositronPrimary             6
                2001   CrPositronReentrant          6942
                2002   CrPositronSplash             6815
                3000   CrAlpha                      868
                4000   CrHeavyIon                   132
                5000   Earth10                     3298

+++++
v13r12
+++++
FluxAlg          INFO Computed Rate: 131303 Hz
                Source ID   Source Name           counts
                    0   CrProtonPrimary           6079
                    1   CrProtonReentrant          1497
                    2   CrProtonSplash             1309
                1000   CrElectronPrimary            57
                1001   CrElectronReentrant          6435
                1002   CrElectronSplash             6666
                2000   CrPositronPrimary             4
                2001   CrPositronReentrant          6995
                2002   CrPositronSplash             6800
                3000   CrAlpha                      827
                4000   CrHeavyIon                   108
                5000   Earth10                     3223
```

CAL - changes in response for *ideal* calibration

Response from Zach

Summary:

Slight change in Cal response under 'ideal' calibration mode - result of a minor bug fix. I can make the new code act exactly like the old code if that's important.

Details:

While upgrading the CalXtalResponse unit test, I noticed some minor inconsistencies in the Cal ideal calibration code, notably an integer truncation of a floating point value.

Changing this value resulted in slightly modified Cal overall gain in ideal mode. LEX8 adc values (for example) in GR v13r13 are lower than those in v13r12 by an average of 0.0017% (varies slightly due to quantization).

Another result is that a few crystals will no longer pass zero suppression. I saw this happen to 2 channels out of 1000 events with the vertical_muon 1gev source.

While the new code is certainly better than the old code, the new output data could only be called 'infinitesimally' more correct than the old data. That is to say, I can tweak the calibration constants so that we get exactly the same answer as before, but still use the improved code.

This only affects 'ideal' calibration mode - which basically means simulated data only - in fact most 'real' simulations no longer use ideal cal calibrations.

I'm attaching a pdf with a few illuminating plots I used to dig out this problem. I used CalTuple to do the analysis, so the plots are displaying slightly different quantities than those created by systest, but I think the underlying problem of a slight shift in Cal ADC output is the same.

Plots comparing the CalXtalAdcPeds for v13r13 and v13r12. ([pdf](#))