Trunc64 FSSC Report

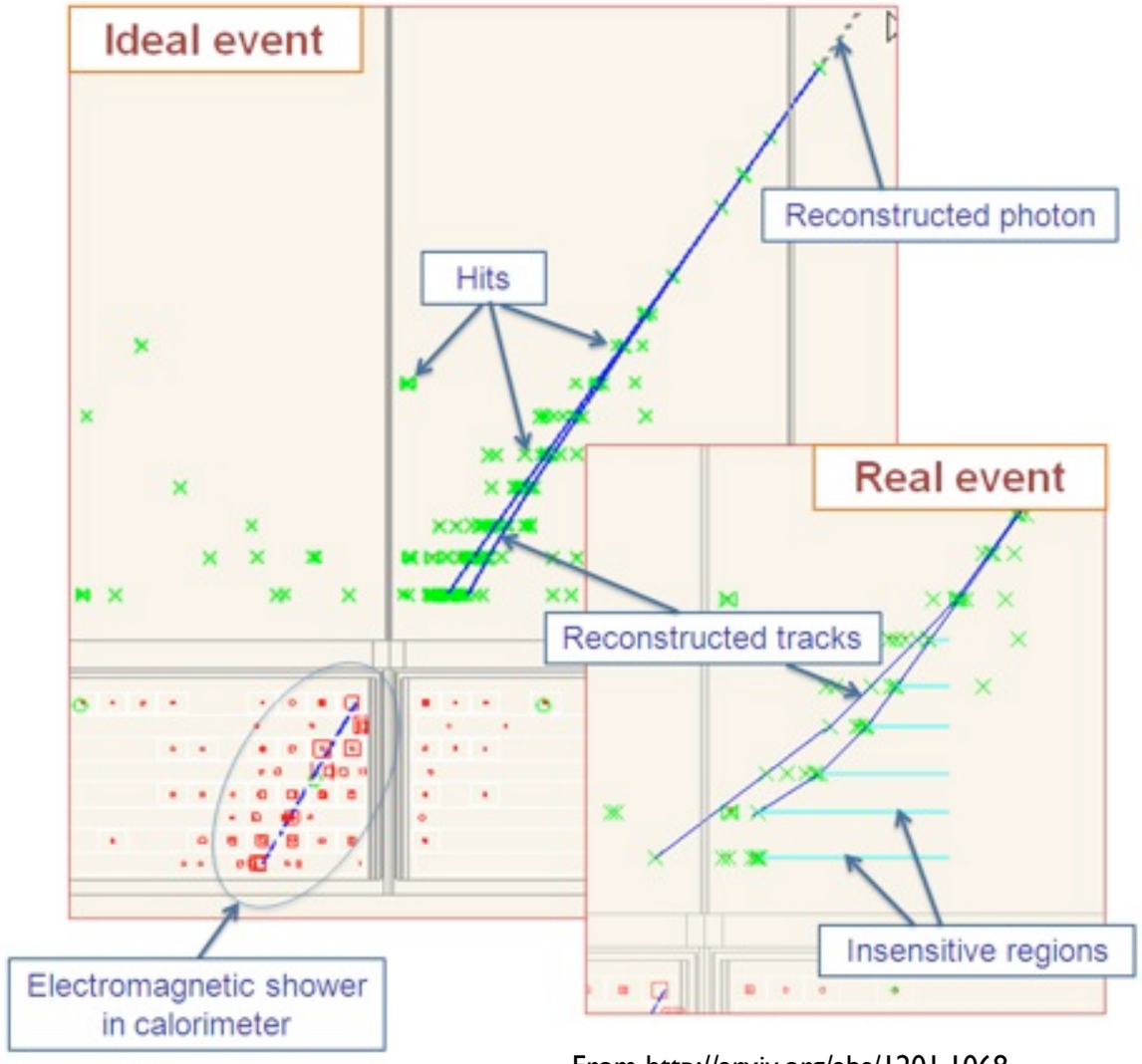
Jeremy S. Perkins, FUG Meeting, Jan. 14, 2013

What is it

- The tracker readout electronics limits the number of hits that can be readout and therefore we are effectively loosing information for high-multiplicity events (i.e. high energy events and especially high-energy events at large angle).

- We now have some evidence that this loss of information causes some degradation of the PSF for the events affected by the issue.

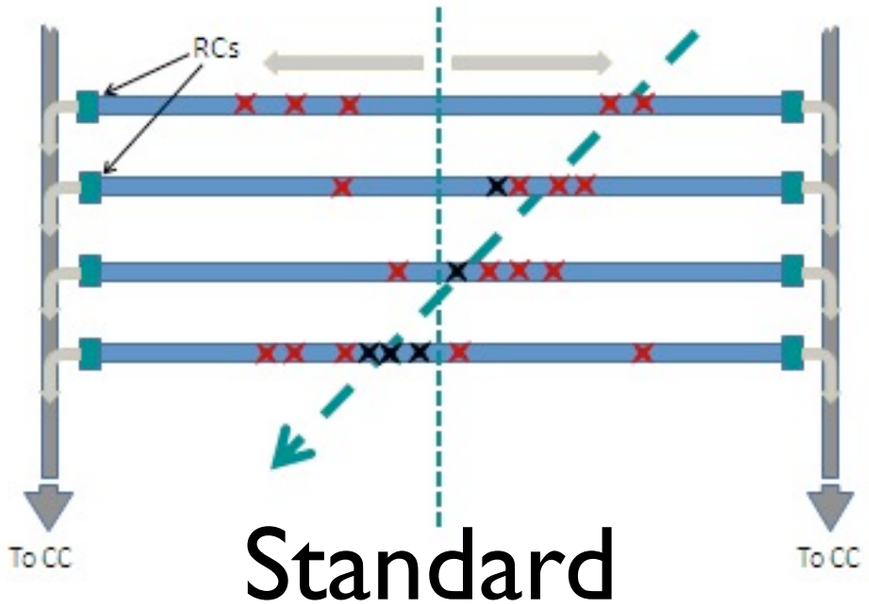
- See http://arxiv.org/abs/1201.1068 for more details.



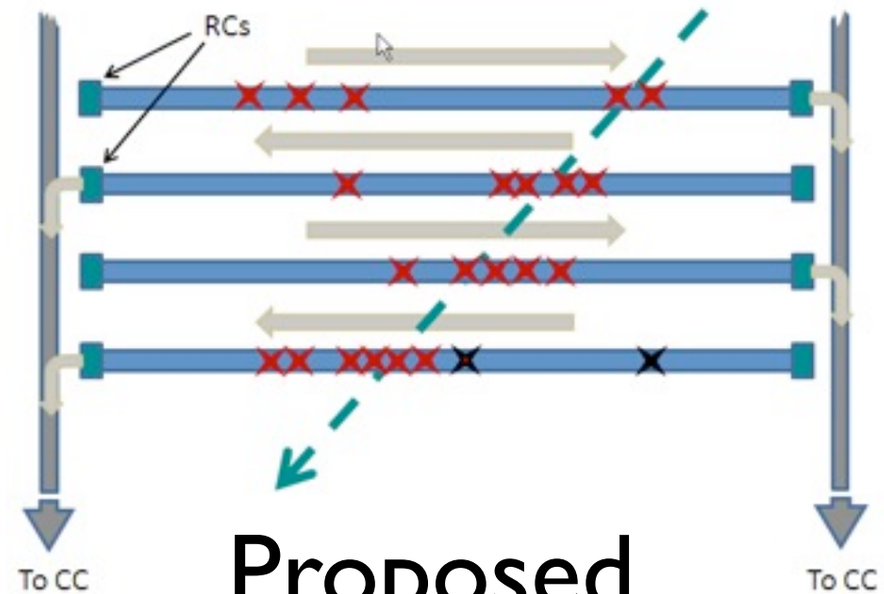
From http://arxiv.org/abs/1201.1068

Solution and Benefits

- Read out alternate layers on separate controllers instead of half of each layer. This doubles the buffer size and better utilizes the cable controller.
- We also taper the buffer size from the top to bottom.
- Already tested this solution in flight (Nov. 13th, 2012 and Dec. 18th, 2012) and validations are underway.
- Preliminary analysis indicate that the Aeff and PSF are improved in both Pass7 and Pass8.
- Final implementation is under discussion (but sooner rather than later is preferred).



Standard



Proposed

From http://arxiv.org/abs/1201.1068

Implications for High-Level Data Analysis

- When (not if) Trunc64 is activated we will effectively have two different instruments before and after.
- This means everyone doing science analysis from then forward will need to perform a composite likelihood (already available in the python interface).
    - The atomic 'gtlike' program will be deprecated (or replaced by a 'gtlike'-like python application).
- There will be a new ScienceTools release along with new IRFs (and new diffuse models).
    - The ScienceTools will from then on use time-dependent IRFs.
    - Users will need to have separate diffuse models for each time period.
- Note that there will be a time period (3 - 6 months) were the performance of the detector is unknown. The old IRFs will not apply to the new instrument and there will not be enough data to generate new inflight IRFs.
    - Solutions might be to make an educated guess about the IRFs during this time or to perform some sort of 'software truncation.'

User Outreach / FSSC Response

- We would like some feedback on how detailed/comprehensive our response should be.
- Some thoughts:
  - All of the documentation and tutorials on the FSSC website will need to be updated and reviewed to reflect this change.
  - We will also need to familiarize ourselves with the new methods (we need to be experts).
  - What type of 'education' effort should be made? Should we warn users that this is coming?
  - Should we provide complete tools to make the change transparent or should we provide enough information to allow users to learn/change on their own.