LAT Data Analysis Priorities

Eduardo do Couto e Silva

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What is coming in the near future…?

- Pre-ship Review before we ship from SLAC
  - few weeks from now !!!
    - see next slides

- Data Taking at NRL
  - mostly study environmental effects
    - more on that later…

- Pre-ship Review before we ship from NRL to Spectrum Astro
  - few months from now
  - The SVAC activities will grow in scope and we will have a group called Science Operations within the ISOC
    - will be in place by then and we are should have prototype tools that we will use on-orbit
      - we are currently developing a plan and we will soon share with you for comments

- Of course, our vast army is also shared between
  - beam test
  - DC2

Today’s discussion
Current Status of Calibrations

• LAT was calibrated using non FSW runs
  – all constants are loaded in the SAS database
  – usage of constants in SAS code has been validated with SAS reconstruction
  – results from online/charge injection data needed to validate constants were analyzed
    and incorporated in final values
  – process for doing all that is not yet optimal

• Calibration constants are adequate for data taking with FSW
  – trigger rates indicate that thresholds are reasonable
  – muon and ToT peaks confirmed that calibrations are still adequate
    – need more details on that (see next page)

• Calibration infrastructure needs improvement for NRL
  – retrieve configuration using MOOT
  – analyze charge injection data using offline chain querying MOOT
    – must be ready for TVAC in NRL since we will recalibrate when we reach hot/cold
      plateaus
  – formalize validation process within ISOC
  – Additional data analysis needed for NRL
    – verify stability of TKR alignment
    – verify stability of ACD/CAL pedestals
    – verify predictions for dependencies of ACD efficiencies on Temperature
    – anything else?
We would like to use runs taken with FSW to demonstrate the following

- Multiple Trigger Engines are configured properly and rates/per engine agree with expectations for ground cosmic rays
  - see Andrea’s talk last week
- ROI are configured properly and performance agrees with expectations for ACD tiles shadowing TKR towers
  - see Andrea’s talk today! (non FSW only)
- Quantities that depend on calibrations/thresholds agree with expectations for surface cosmic rays
  - position/width of muon peaks/CAL module
  - pedestals for ACD and CAL
  - peak position/width of ToT distributions for MIPs
  - noise occupancies for ACD, TKR and CAL
- Deadtime for different readout modes agree with expectations
  - zero suppression enabled/disabled
  - CAL range (one or four)
    - see Warren’s talk in IA6 using non FSW runs
- Extrapolate muon tracks to the CAL
  - verify position resolution and “PSF with muons”
    - see Dave’s talk in IA6 using non FSW runs
- Extrapolate muon tracks to the ACD
  - verify geometry and efficiencies
    - see Eric Charles’s talk in IA6 using non FSW runs
- Study LAT performance when we change the PDU voltages
  - Search for increase in noise occupancy, extra sources of noise or changes in pedestals
    - see Stefano’s/Claudia’s talk in IA4 using non FSW runs and 2 towers
- Study LAT performance when we add external rate to the data flow system
  - Does the deadtime change in an expected way?
    - see Warren’s talk in IA4 using non FSW runs and 2 towers
- TKR “flares” other idiosyncrasies
  - we need to monitor the LAT behavior as we collect more and more data to evaluate the LAT response as function of time
    - geared towards ISOC
    - hard to specify what to plot and what to look for
    » the bottom line: do not give up on the LAT data

Need to quantify results! agreement within 1%, 10%...?