LAT Data Analysis Priorities

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What is coming in the near future…?

Today's discussion

- **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**

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?

LAT Pre-Ship Review

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 speciy 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%...?