Instrument Analysis Status

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Science Verification, Analysis and Calibrations /
ISOC
From ISOC All Hands Meeting

System Commissioning/ System Test -> Offload & Set-up LAT
5/11/06

CP

Sine Vibe

Install Radiators

EMI/EMC Test

5 days

5/16/06

5/25/06

PER

2 days

11 days

Acoustic Test

We Are (still) Here

Pre TV

T-Bal

T-Cycle

CP

Remove Radiators

Weight & CG

Pack and Ship

8 days

40 days

3 days

2 days

2 days

2 days

9/15/06

PSR

9/13/06

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Instrument Analysis Activities

• April/May: Supported LAT commissioning at SLAC!
  – Data processing aka pipeline
  – Data monitoring
  – 'Flight Software' debugging:
    – Several FSW problems first seen in offline
    – Because we were looking :-(
      » Not always as quickly as we could have ..... :-(
  – Data analysis:
    – Not as much as I had hoped for – mostly because ..... 
• Commissioning support completely overwhelmed us here at SLAC!
  – SVAC got completely sucked into operations!
    – We had to! We had lots of fun!
    – But ..... 
  – Coordination of analysis activities suffered.
• Continue support during environmental testing at NRL:
  – Data is transferred from NRL to the SLAC pipeline
  – All data processing is done at SLAC!
    – Plus ca change .....
Testing@NRL

• Lot of activity going on at NRL:
  – Test scripts and reports being written by each subsystem
  – Lots of data to look at after each test!
    – And signing off on .....  
  – CAL:  
    – http://www.slac.stanford.edu/exp/glast/ground/Calibrations/TestReports/NRL/EMC-EMI/CAL
  – ACD:  
    – http://www.slac.stanford.edu/exp/glast/ground/Calibrations/TestReports/NRL/EMC-EMI/ACD
  – TKR:  

• Alignment:
  – Johann has started inter-tower alignment monitoring:
    – It would be nice to know if towers moved during the shake test ......
  • NB!
    – This is just a monitoring tool, not a real inter-tower alignment! Johann and Eric will start working on this.

• This is the time to catch problems:
  – And we catch them by looking at the data!
    – It sounds kind of obvious, doesn't it? ;-)

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It's Easy To Contribute

• During environmental testing at NRL:
  – Each subsystem is looking at subsystem specific quantities:
    – Typically pedestals, hot strips etc
  – Things that would quickly flag a problem in their subsystem
  – And they do this well:
    – See report links on the previous page
  – You can also contribute:
    – A very nice example is Yvonne's light tight analysis:
      » See IA talks for details
    – Lessons learned:
      » We all learn (to appreciate things) from these high level analyses from non-expert users
      » Even a high-level ntuple analysis can give us a detailed description of the instrument performance
      » And especially tell us that there is no significant problem after a specific NRL test
  – Dialogue: subsystem expert – general user!
    – There is still a lot of information and knowledge that is “known” by a few experts.
    – IA meetings help spread this knowledge! Not only sharing the pain :-)

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Hey! It's Your Instrument (Analysis)!

• Instrument Analysis:
  – How are we doing?
  – In some ways, very well!
    – Subsystems are doing a great job analysing the NRL test data.

• But I am worried ......
  – Why?
  – Well, I have a list of things to look at:
    – Time structure of LAT Charge Injection runs:
      » Can we speed up LCI runs?
    – Run start up:
      » Trigger rates in the first few seconds not always what they should be
    – Deadzone events:
      » Rate as expected? What are they?
    – Extrapolate muon hypothesis tracks to the ACD:
      » Geometry, efficiencies ....
    – Performance when LAT is horizontal (for TVAC)
  – But that is not the real problem ......
What Did We Miss?

- It's not so much what I can think of:
  - It's the Rumsfeld 'unknown unknowns'!
- I would like people to look at the data!
  - In ways we couldn't think of:
    - Find bugs or problems or features we didn't find.
- Science Working Groups needs:
  - What do you need for your physics analysis?
  - Well, think about it now!
    - If somebody $#@ up, this is the time to discover it.
- Example of what I would like to see:
  - Dave:
    - Pulsars need good absolute timing!
    - Can we guarantee that it's correct/within specs?
    - Starts asking questions:
      » See Friday IA talk
      » And gets people thinking
      » (Nice occasion to learn about Time Tones!)
    - Why should we worry?
      » Chandra HRC event time, Mars Climate Orbiter ......
200M muons Can't Be Wrong

- We have lots .... but really lots of muons ....
  - And gammas and .... whatever else we have in cosmic rays
- And a very nice fully calibrated instrument!
- I can only encourage you to use it
  - Yeah, I know:
    - You're busy with DCn simulations and analysis ....
    - and beamtest
- But don't forget:
  - This is the Instrument
  - With Flight SoftWare
  - What you see is what you get!
    - In Orbit!
- What you don't learn about now:
  - You will regret later!
- SVAC is at your service:
  - If you need anything, let us know!
    - MC, special (muon) processing .....
Summary

• We’re in the middle of EMI testing at NRL:
  – Limited set of people looking at lots of data!

• Soon to come:
  – TVAC!
  – Will run 24/7 - for 40 days:
    – Will need to spread the burden joy!
  – And remember:
    – We will run horizontally!
    – Lots of horizontal data from SLAC to look at!

• Subsystem specific analyses:
  – Going well!
  – But help always appreciated!

• Instrument analysis:
  – Need help:
    – For some specific topics
  – But especially for people to look at the data from a complete instrument point of view:
    – Think about what you need for the science you want to do!
  – Lots of data to play with!
Afterword

Help, I need somebody,
Help, not just anybody,
Help, you know I need someone, help.

When I was younger, so much younger than today,
I never needed anybody's help in any way.
But now these days are gone, I'm not so self assured,
Now I find I've changed my mind and opened up the doors.

Help me if you can, I'm feeling down
And I do appreciate you being round.
Help me, get my feet back on the ground,
Won't you please, please help me?

Four guys from the town of the best football club ever!

Anders W. Borgland