Overview of Data Taking

aka the “Don't Shoot the Messenger” talk

Anders W. Borgland

Science Verification, Analysis and Calibrations
Vive la France – 14 Julliet !

et les Etats-Unis aussi...

From Eric

Crystal imaging with Tkr: Tkr-All: Nhits per bin

From Warren

2-Tower B/10
4 range, zero suppressed

Minimum deadtime = 1308
Consistent with prediction and observed minimum event separation of 1309

2-Tower B/13
4 range, unsuppressed

Minimum deadtime = 13128
Consistent with observed minimum event separation of 13129
We are doing fine!

From Martin

- Up to now 6 towers have been timed in.
- The results are very consistent so far:

<table>
<thead>
<tr>
<th>Tower</th>
<th>0</th>
<th>1</th>
<th>4</th>
<th>5</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>TREQ CAL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TREQ TKR</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>TREQ EXT</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>14</td>
</tr>
</tbody>
</table>

EXT = Muon Telescope

From Nico

Fraction of ToT saturations:
- 0.21 % all events
- 0.05 % muons
- 0.31 % showers

From Pisa (Michael et al)

From Zach

<table>
<thead>
<tr>
<th>htemp</th>
<th>Entries</th>
<th>3229</th>
<th>Mean</th>
<th>-3.008</th>
<th>RMS</th>
<th>14.51</th>
<th>$\chi^2$/ndf</th>
<th>111.3/40</th>
<th>Constant</th>
<th>542.5 ± 13.0</th>
<th>Mean</th>
<th>-2.505 ± 0.183</th>
<th>Sigma</th>
<th>9.973 ± 0.159</th>
</tr>
</thead>
</table>
Really fine!

Wrong calibration constants applied for some towers

From Hiro

From Monica

From Mizuno
From Dan Flath…

Welcome to Adam Sun's Szechwan Cafe.

Whether you are a regular here or a first time guest, if there is something you have been wanting to try that is not on the menu or if you just want something new, your host, Adam would be pleased to arrange a menu that is specially designed for you. His regulars enjoy this service and you can too. Just ask for Adam.

We are open for lunch and dinner in the heart of Palo Alto’s California Avenue’s business district. We are available for catered events, providing elegantly decorated and delicious Szechwan Cuisine. With over 20 years of experience, Adam Sun knows how to please.

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Lunch and dinner, closed Sundays.
Szechuan and Hunan styles in an informal, elegant atmosphere.
Tel. (650) 327-1638
What next?
3-in-a-row TKR Trigger

- we want to find topology to maximize timing effects in TKR distributions

Muons usually produce trigger requests for all of the 16 allowed combinations of 3-in-a-row.

There is no way to know which of the 16 3-in-a-row is responsible for the trigger.

Bits

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
</tr>
</thead>
</table>

Trigger on top only

Bits

| 0 | 1 |

Trigger on bottom only

Bits

| 0 | 0 |

Bits

| 0 | 1 |

From Dario
CAL trending/monitoring

From Dave

- Hi rate (20 kHz, red)
- Big events (yellow)
- 27 (red)
- 29 (yellow)
- 28 volts (B/2, blue)

Hi rate (20 kHz, red),
Big events (yellow)
B/2 (blue)
From Stefano and Claudia

**PDU Voltage**

- Base
- Min
- Max

**Top Plane = 35**

**Bottom Plane = 0**

![Graph](image)

<table>
<thead>
<tr>
<th>h9006</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Entries</td>
<td>36</td>
</tr>
<tr>
<td>Mean</td>
<td>16.39</td>
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<tr>
<td>RMS</td>
<td>10.29</td>
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<tr>
<td>Underflow</td>
<td>0</td>
</tr>
<tr>
<td>Overflow</td>
<td>0</td>
</tr>
<tr>
<td>Integral</td>
<td>2.202e+05</td>
</tr>
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</table>
Muon $\phi$ distribution

From Francesco
Example of Analysis linked to STR

How many times does every xtal go over threshold when the total energy in the CAL is less than 10 Mev?

* See Eric/Sasha's presentation about shaped readout noise
What should we do for Aug 29 Workshop? (1)

- **Study MC generated with ACD + 8 towers**
  - **Anders will start that on Monday**
    - Dario and Monica will help with initial checks before we release it to the group
  - **Need to get familiar with ACD variables**
  - **Start thinking how we will set up tests using ROIs to do analysis that we could not do so far**

- **Present a list of distributions that capture geometrical dependencies since we can not spend too much time when the full LAT is assembled to learn all that**
  - **Francesco Loparco presented some good ones**
    - They will change as we add more towers

- **Show trending results for calibrations (function of time and per tower)**
  - **Would like to have a comprehensive presentation from both TKR and CAL**

- **Alignment**
  - **Tracy kindly accepted the role to coordinate the effort to produce inter and intra-tower results using TKRrecon in its native framework**
    - Probably this task will be for those with more expertise with SAS recon and usage of G4 propagator

- **We presented results comparing data using different PDU voltages**
  - **How do we know they were set correctly?**
  - **Need to empower users to look at housekeeping data**
    - Only SVAC group does that right now
What should we do for Aug 29 Workshop? (2)

• Data Analysis from Special test Requests
  – Most likely 8 towers without ACD
    – Eduardo will lead the effort and has already started discussions with Hiro, Eric and Su Dong based on inputs from presentations in this meeting
    – As data becomes available we will post it in the IA list and discuss its quality on Friday meetings

• Propose a list of data taking configurations for the full LAT based on what we have learned so far
  – List should contain
    – Hardware configuration we want to test
    – Trigger settings
    – Number of events

  – Eduardo will send a message to science working group coordinators to request a list of instrumental effects they are worried about at the 1 and 10% level for on-orbit effects
    – We will iterate and see what is relevant for GND tests from the point of view functionality and performance
Let’s write a little...

• Analysis Memo (in LAT Docs)
  – Crucial for documenting our effort
  – Essential for sharpening the thought process
  – It is a Live document
    – Should take a day to write
      » Can keep updating it
      » Benoit had a good example from GSI studies
  – Goal of the data analysis
  – State run ID’s
  – Trigger conditions
  – Hardware configuration
  – Analysis cuts
  – Assumptions behind analysis cuts
  – Does not need to be perfect !!!
    » It is not a journal publication

• Overall IA effort results due Dec 2005
  – Eduardo and Nico will work on a draft
We already miss you Dave

Thanks for putting up with us for an entire year !!!!!!!!!!

Thank you Eric for the cartoon!