BigBite Timing Hodoscope SBS Weekly Meeting Update
Hall A Jefferson Lab

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Hardware Status

• Checklist:
  • detector completely repaired and rebuilt – YES
  • HV, TDC, and ADC cables reinstalled correctly and relabeled – YES
  • HV crate working, supplying correct voltage to PMTs and triggers – YES
  • NINO power supply working, thresholds set to 1.5V – YES
  • TDC level translator working, power supply fixed, grounding installed – YES

• daq electronics installed – YES
  • TDC Caen v1190s and ADC v792s, and cables working properly – YES
  • CODA3, ROC, and PEB working and connected – YES
  • seeing TDC and ADC signals for every bar on oscilloscope and from daq – YES
  • Several successful data runs taken – YES
Hardware Status – individual bars
Hardware Status – detector
Data Analysis Status

• Checklist:
  • data files ready to be analyzed – YES
  • data files decoded and converted to a rootfile – YES
    • analyzer, root, and sbs-offline installed – YES
    • updated CAEN 1190 class to include TDC leading and trailing – YES
    • setup database with crate and channel mapping – YES
    • sbsoffline runs with updates to detector class – YES
  • analysis scripts ready for rootfile – YES
    • rootfiles data analysis complete – NO
      • gain matching – IN PROGRESS
      • threshold studies – NO
      • timing resolution and time dependence – NO
Fitting ADC Pedestals

- Fit pedestal with gauss and subtract mean
Fitting ADC Pedestals

ADC Chan vs. ADC Pedestal Mean

<table>
<thead>
<tr>
<th>hADCpM</th>
<th></th>
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<th></th>
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<tbody>
<tr>
<td>Entries</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean x</td>
<td>31.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean y</td>
<td>129.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std Dev x</td>
<td>18.47</td>
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<td></td>
<td></td>
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<tr>
<td>Std Dev y</td>
<td>14.97</td>
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</tbody>
</table>

ADC Pedestal Mean

ADC Chan
Fitting ADC Pedestals

ADC Chan vs. ADC Pedestal Width RMS

<table>
<thead>
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<th>hADCPW</th>
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<tbody>
<tr>
<td>Entries</td>
<td>64</td>
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<td>Mean x</td>
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<tr>
<td>Mean y</td>
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<td>Std Dev x</td>
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<tr>
<td>Std Dev y</td>
<td>1.447</td>
</tr>
</tbody>
</table>

![Graph depicting ADC Chan vs. ADC Pedestal Width RMS](image)
Filling and Fitting ADC Spectra

- Cut out pedestal, vertical cut on neighbors ADC > 250, fit with landau by getting bin max
- Normalize to 300 using formula: 
  \[ HV_{new} = \left( \frac{300}{ADC_{mpv}} \right)^{1/10} HV_{current} \]
Filling and Fitting ADC Spectra

**ADC Chain vs. ADC Mean**

- **Entries**: 54
- **Mean x**: 31.15
- **Mean y**: 18.87
- **Std Dev x**: 11.62
- **Std Dev y**: 18.74

**ADC Chain vs. ADC Mean**

- **Entries**: 54
- **Mean x**: 31.15
- **Mean y**: 18.87
- **Std Dev x**: 11.62
- **Std Dev y**: 18.74

**ADC Chain vs. ADC Mean**

- **Entries**: 54
- **Mean x**: 31.15
- **Mean y**: 18.87
- **Std Dev x**: 11.62
- **Std Dev y**: 18.74

**ADC Chain vs. ADC Mean**

- **Entries**: 54
- **Mean x**: 31.15
- **Mean y**: 18.87
- **Std Dev x**: 11.62
- **Std Dev y**: 18.74
Plotting ADC Spectra

hADCV_Bar27

hADCV_Bar29

hADCV_Bar13

hADCV_Bar11
Plotting ADC Spectra

hTOT_Bar29_Right

hTOT_Bar13_Right

hTOT_Bar29_Left

hTOT_Bar13_Left
Plotting TDC Spectra

hTDC_WalkTOT_Bar29_Right

hTDC_WalkTOT_Bar27_Right

hTDC_WalkTOT_Bar13_Right

hTDC_WalkTOT_Bar11_Right
Summary

• detector completely assembled and bars tested
  • To Do:
    • write up documentation on repairs and reassembly process
• daq working, seeing signals for all channels
  • To Do:
    • write up documentation on daq and detector setup in TEDf
• data taken, ready for analysis
  • To Do:
    • complete gain matching
    • begin study of thresholds for NINOs
    • finish timing analysis
• prep for installation mostly complete