

SBU GEM DAQ Update

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Contents

Update MPD-APV readout

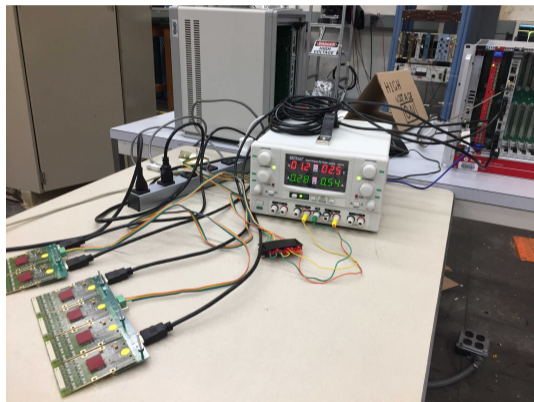
Summer Projects

Summary

- ▶ June 15th: Received two MPDs, APV cards, backplanes from Dustin
- ▶ June 19th: initialized MPD with libmpd ver 3.0 and CODA 2.6.2
- ▶ June 20th: Set up DC power supply for 2 APV cards
- ▶ June 21-22nd: Fix bug: APVs false initialization
- ▶ June 23rd: Dustin suggested me trigger two APV cards with v965 as a TI, bug: FIFO error, DMA memory check failure
- ▶ June 27th: Bryan updated jvme-devel and fixed FIFO error. Output data files
- ▶ June 28th: verify event frame with jEventViewer
- ▶ June 29th: data(pedestal) taking with 2-slots + 4-slots backplanes, 6 APVs

Settings for APV test

- ▶ VME64 crate
- ▶ ROC: XVB602
- ▶ 6 APV cards on two backplanes
- ▶ 2 Analog + 2 Digital HDMI
- ▶ 6 samples per event, 40 MHz
- ▶ DC power: +2.5 V , +1.25 V



jEventViewer : coda-user github

I am able to locate

- ▶ Block Header
- ▶ EVENT_TAG: 0x10000000
MPD_TAG : 0x20000000
ADC_TAG : 0x30000000
HEADER_TAG:0x40000000
TRAILER_TAG: 0x50000000
- ▶ Pedestal level: ~ 800 (decimal).
- ▶ Cross check with data length : $4692 / (128*6) \approx 6$ (APV)

Next: get started with decoder to validate pedestal data

Jevio Event Tree

File View Dict Event Filter

Event # Event Q Limit event source

Size dictionary

EVIO event tree

- [-] <Event> has BANKs: tag=1(0x1) num=204(0xcc) dataLen=4737 child
 - [-] BANK of UINT32s: tag=49152(0xc000) num=0(0x0) dataLen=3
 - [-] BANK of BANKs: tag=4(0x4) num=45(0x2d) dataLen=4730 children
 - [-] BANK of UINT32s: tag=1(0x1) num=0(0x0) dataLen=34
 - [-] BANK of UINT32s: tag=2(0x2) num=0(0x0) dataLen=4692

| | 1 | 2 | 3 | 4 | 5 |
|--|-----------|------------|------------|-----|-----|
| | 536870916 | 805306368 | 1073745511 | 772 | 746 |
| | 832 | 875 | 740 | 785 | 859 |
| | 885 | 760 | 802 | 849 | 907 |
| | 734 | 811 | 863 | 858 | 782 |
| | 767 | 856 | 895 | 752 | 803 |
| | 867 | 887 | 764 | 814 | 865 |
| | 890 | 753 | 804 | 885 | 886 |
| | 802 | 777 | 851 | 882 | 782 |
| | 784 | 875 | 881 | 760 | 811 |
| | 854 | 894 | 770 | 836 | 861 |
| | 850 | 811 | 808 | 842 | 868 |
| | 772 | 814 | 859 | 901 | 760 |
| | 809 | 831 | 870 | 770 | 829 |
| | 897 | 833 | 678 | 725 | 801 |
| | 811 | 761 | 768 | 810 | 846 |
| | 713 | 765 | 805 | 800 | 745 |
| | 765 | 845 | 843 | 756 | 753 |
| | 826 | 842 | 732 | 782 | 837 |
| | 859 | 701 | 776 | 837 | 835 |
| | 768 | 804 | 865 | 942 | 748 |
| | 742 | 799 | 804 | 757 | 791 |
| | 790 | 856 | 725 | 802 | 798 |
| | 838 | 760 | 799 | 856 | 879 |
| | 738 | 760 | 817 | 806 | 735 |
| | 787 | 811 | 872 | 720 | 780 |
| | 836 | 834 | 727 | 795 | 852 |
| | 892 | 1342177280 | 1073742691 | 867 | 867 |
| | 867 | 867 | 867 | 867 | 867 |
| | 867 | 867 | 867 | 867 | 867 |
| | 867 | 867 | 867 | 867 | 867 |

structure tag length

data type number description

Summer Projects

Undergraduate students: Marisa Petrusky and Daniel Delayo

- ▶ GEM detector alignment (Marisa)
- ▶ Tracking software development (Daniel)

Tracking detector alignment - χ^2 Minimization

- ▶ 3D rotation and translation offsets as fitting parameters
- ▶ Parameter minimization to agree with 3D linear equations
- ▶ **Known issue:** χ^2 is insensitive to translation parameters, known as 'weak mode' for Atlas inner detectors
- ▶ Possible solution: combine quartz signal and charge distribution in X-Y into analysis

