Experience with the Alibava system

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What we have

- Installed system summer ‘09
- Software
  - Very nice instructions and scripts
  - Undergraduate summer student got everything to work
  - Use Liverpool sin_preguntas with a few additions lines
  - Note – analysis package does not work with ROOT v 5:20 – need an earlier version e.g. v 5:18
- Hardware
  - Use freezer to house set-up and PMT trigger
  - Motherboard resets when we plug-in/plug-out the freezer
  - Detectors mounted onto ceramic detector mount for better thermal performance
  - Additional PT100 on detector ceramic
  - No additional effort pay to cooling chips except for adding a heat sink for better heat loss to environment
  - Cold operation require Liverpool fix (readout rate and FPGA re-prog)
  - Calibration circuit does not work in the cold – gain = 1 in Liv^{pool} sin_preguntas
  - Calibrate with un-irradiated planar strip detector
  - Remember that the Beetle gain is a function of chip voltages and capacitive load

Experience

- The DAQ software crashes every so often
  - Could it be due to the freezer?
  - Restart = Turn system off and re-start PC
  - We run for 100,000 events - longer runs increase risk of crashes
  - Cannot use data after a crash – is it possible?
- Analysis
  - The time spectra is missing info for the 1ns time bin?
  - Changed binning in sin_preguntas to 1 bin per ADC
    - Feel that this is better for fits and look of spectra
  - Problem with root
    - Fit of Landau does not return most probable value
    - Value is too low
    - Error in fit gets worse with higher noise in the system
    - Better to extract the peak by looking at the curve
- Added code to
  - write out 2D histos of time spectra and noise per channel on chip1/chip2
    - Look at funnies is data :
    - Extra noise in first few channels of each chip
    - Large signals in baseline signal due to the very few high signal events
  - write out signal spectra histo
    - Can combine root histos to allow larger data sets to be used

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Results

- System has enabled
  - First charge collection studies of irradiated 3D double-sided detectors
    - Work presented at the IEEE NSS
    - Presented at RD50 tomorrow
    - Paper planed for early next year
  - Study of highly irradiated planar devices (on-going)
    - Thesis study with aim to be finished first part of the study this year

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Thank you for a lovely system

Easy to set up

Easy to use