

Internship on FEV8_COB testbench at LAL



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Introduction

- ITAEC-ILC Group at LAL Collaborative Research PROGRAMME
-internship to train for operating readout-electronic prototypes(6/3/2017~30/3/2017)



✓ ITAEC(IT Accelerator Engineering Center) at SKKU

- ✓ Pf.Chai
- ✓ Leader of ITAEC



Huisu Kim
PhD in EEE at SKKU



Working with
Roman, Adrian,
Stephane and
Remi

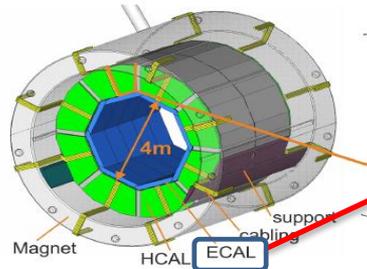


Bokyeom Kim
Master in EEE at SKKU



FEV8_COB testbench

The highest channel density in the final detector



Event at ILC

Analog signal



SKIROC_FEV8_COB
8chips with 64 ch each

Digital signal



Data adaptor



DIF

Trigger pulses

DIF data

Trigger pulses



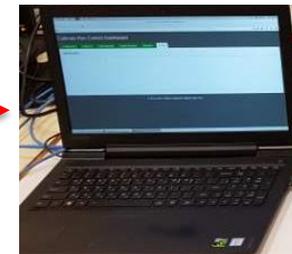
Spill signal



CCC



GDCC



Computer
(calicoes-DAQ)

?eV

FEV8_COB was used in the past.

Now need hardware & software update respect to earlier version

Measurement of testbench

CALICOES

- DAQ software for Silicium Tungsten Electromagnetic Calorimeter for ILC/ILD.
- allows controlling the hardware part of the calorimeter and acquiring data
- based on the Pyrame framework.

Calicoes Run Control Dashboard

Configuration | Script run | State Machine | RunDB browser | Statistics

Errors

Update list of available run scripts

user/test_script

Currently loaded script: /opt/pyrame/rc_scripts/user/test_script.py

Reload script

name of run: tests/20170320_180926

maximum trigger threshold for scurves: 350

minimum trigger threshold for scurves: 100

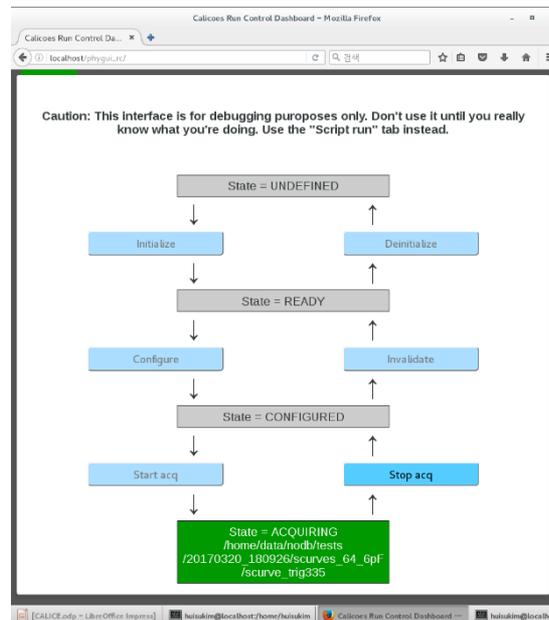
stop of scurves: 5

acquisition time for scurves per step (s): 30

Run script | Stop script

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Data scanning by script
*script in python form



implementation
on state machine

Calicoes Run Control Dashboard

Configuration | Script run | State Machine | RunDB browser | Statistics | Errors

Values updated every 2 s

Variable	Value
Acquisition	/home/data/nodb/tests/20170320_180926/scurves_64_6pF/scurve_trig340
# of data packets	3398.0
# of lost packets	0
# of control packets	0
# of acquired bytes	3039270.0
# of spills	146.0
current spill	146.000000
# of hits for all dfls	2333.0

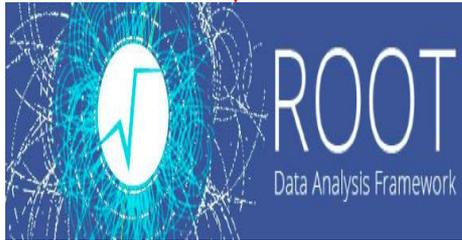
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Statistics of data

Postprocessing of data

We are now on finding noisy channels to deactivate it

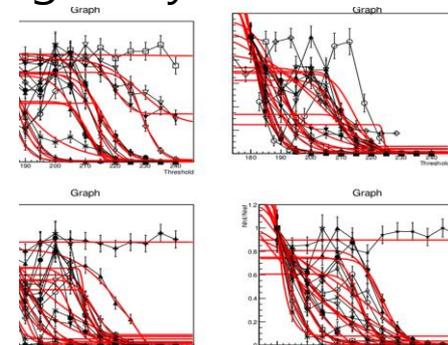
Raw data from hardware/calicoes



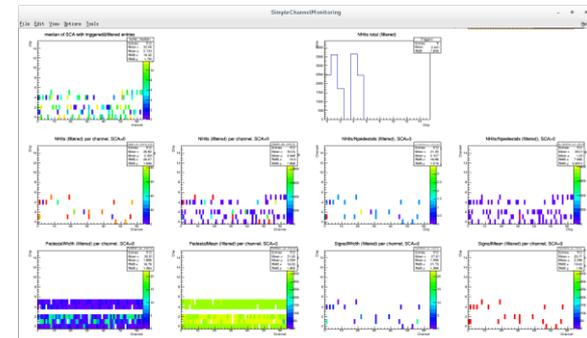
Converter program

Converted Root data

Tpecal
-Data
analyzing
program



<threshold scanning>



<monitoring channels>

Problems of testbench

Problems

1. Some broken noisy channel exist -always triggered
2. broken noisy channel wasn't maskable
3. Spurious bits from DIF, uninterpretable
4. Physically impossible data

Cause

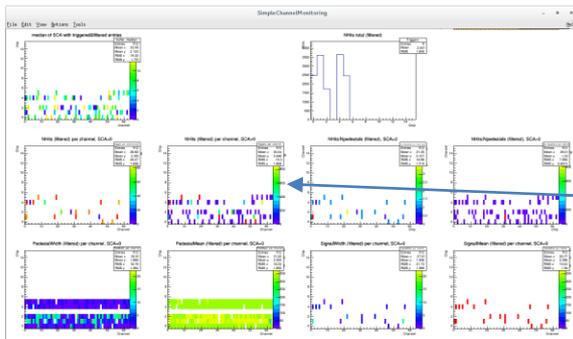
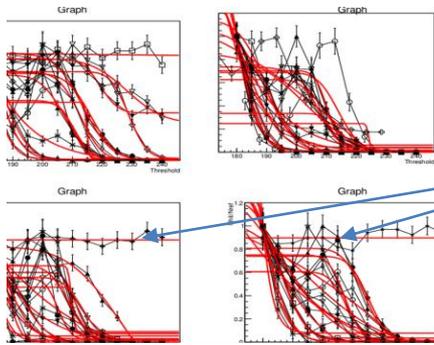
Incompatibilities in the data processing

- Data was good before update
- FileSize is reasonable (reverse proportional to threshold)

Changed DIF

Good Raw data

Now Converter program needs to be adapted



Future Plan

Short-term plan

- Installing testbench at SKKU
- Training & Mastering FEV8_COB testbench

Long-term plan

- Switch to FEV11 which is now on manufacturing in Korea(FEV8 is outdated)
- If ok FEV11 will be equipped with Si wafers to become part of SiEcal setup
- Experiments with accelerators at ITAEC, DESY and CERN
- Radiation measurement with 6MeV electron linac and 9,10,13MeV cyclotron



<ITAEC Cyclotron>



Thank You