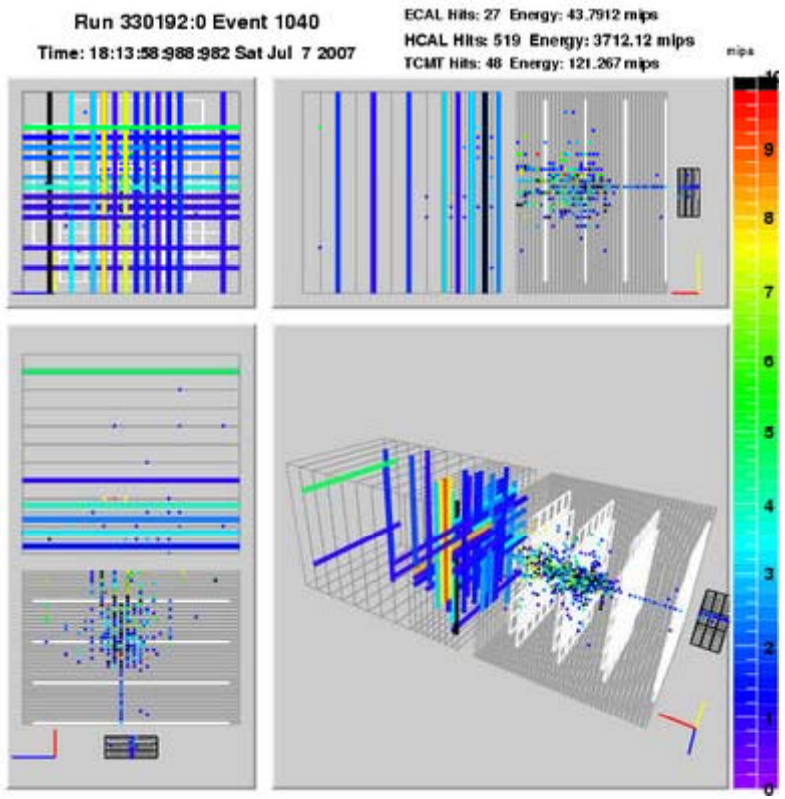
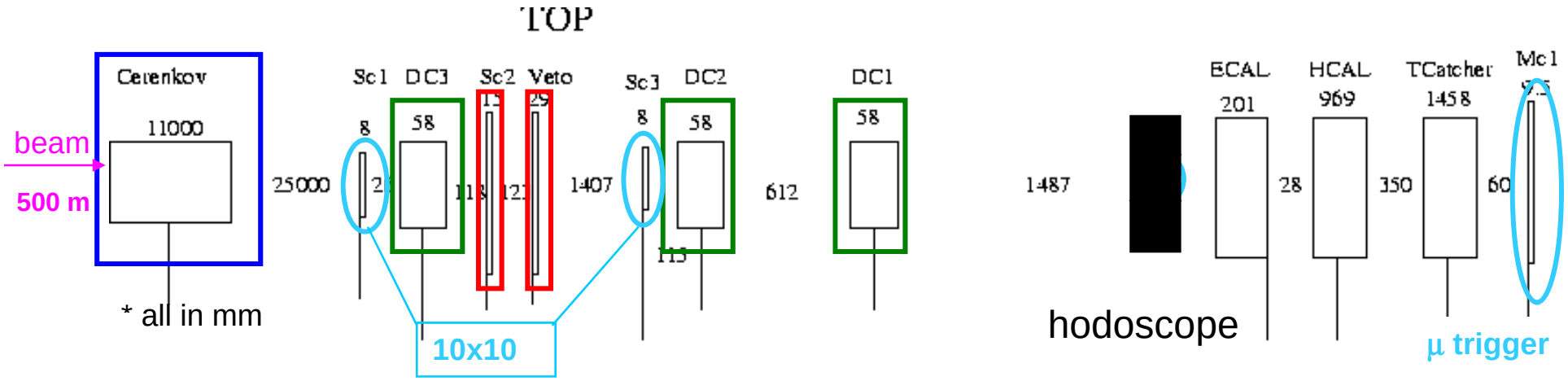
The 2007 CALICE Test beam @ CERN (part II)

Erika Garutti, Fabrizio Salvatore

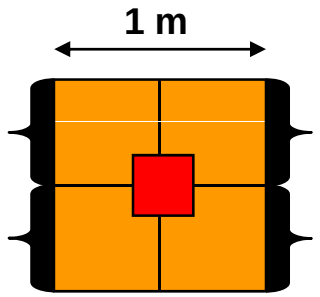


Beam instrumentation description



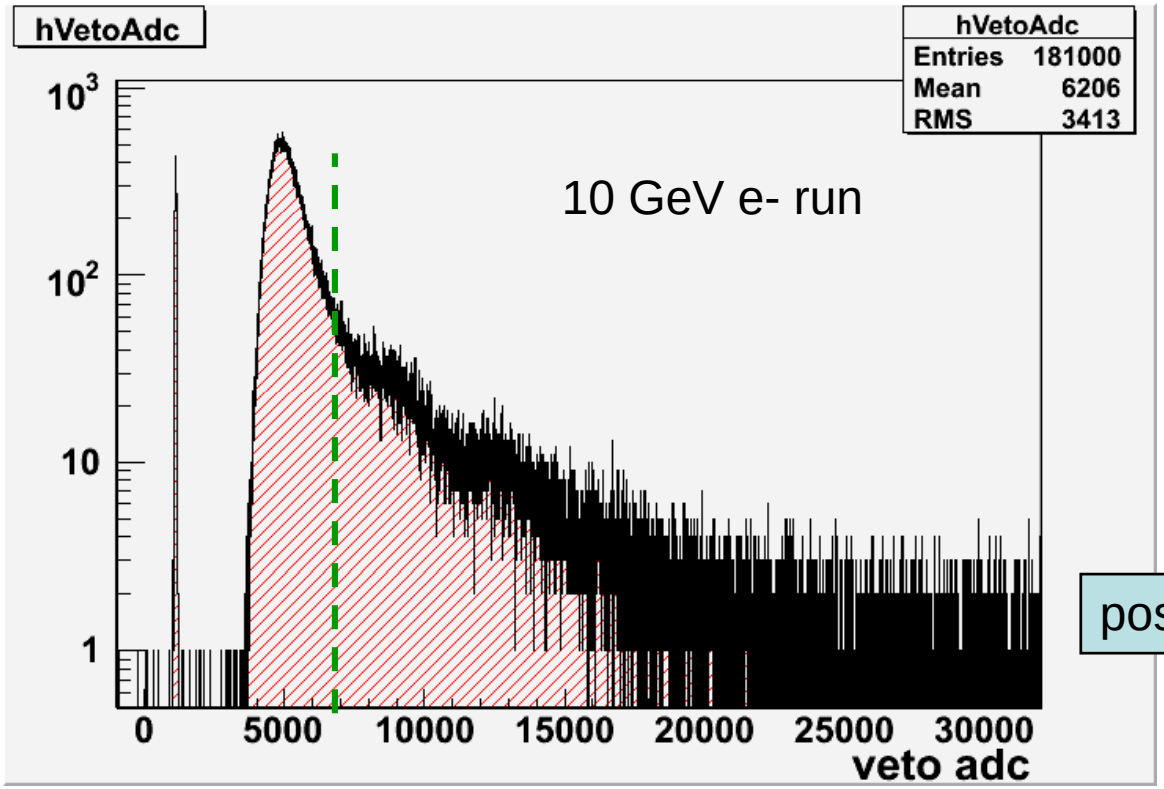
News on the beamline

1) beam info from CERN database available from run 330411
2) Cherenkov operated for e/π and π/p separation
3) 3 x/y pairs of MWPC with double readout
4) 10x10 cm trigger only (no 3x3)
5) amplitude r/o of 1cm thick scint. counter (20x20 inner veto)
   + outer veto with 20x20 cm hole to tag double particle



6) hodoscope installed for initial muon runs and from ECAL chip irradiation to end

The inner veto counter

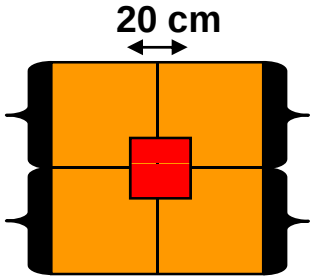


20x20 cm^2 veto counter amplitude readout

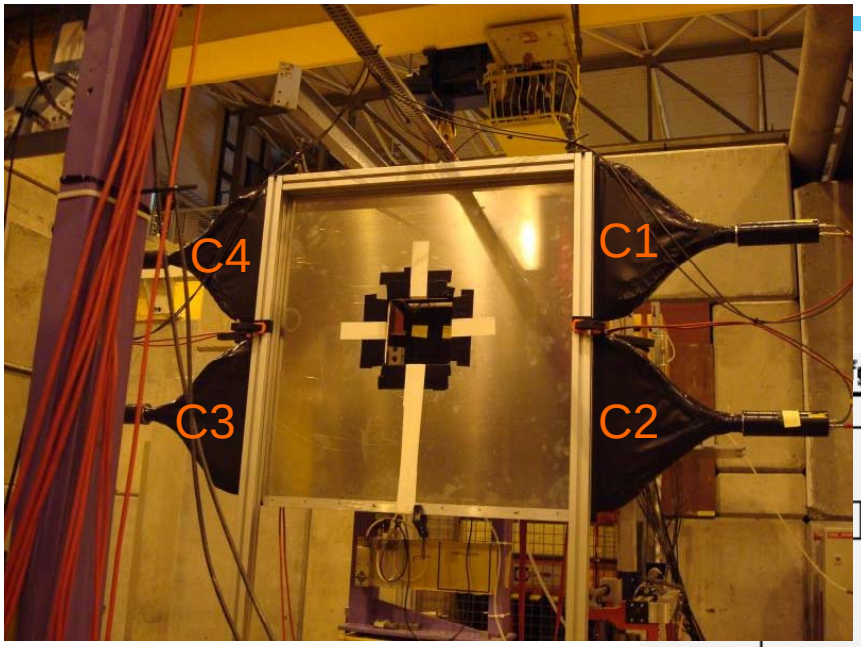
available only from run 330924 on

possible cut veto < 7000 ADC ch

for analysis use analog readout in
crate / slot / fe / chip / chan : 172 / 12 / 4 / 0 / 17



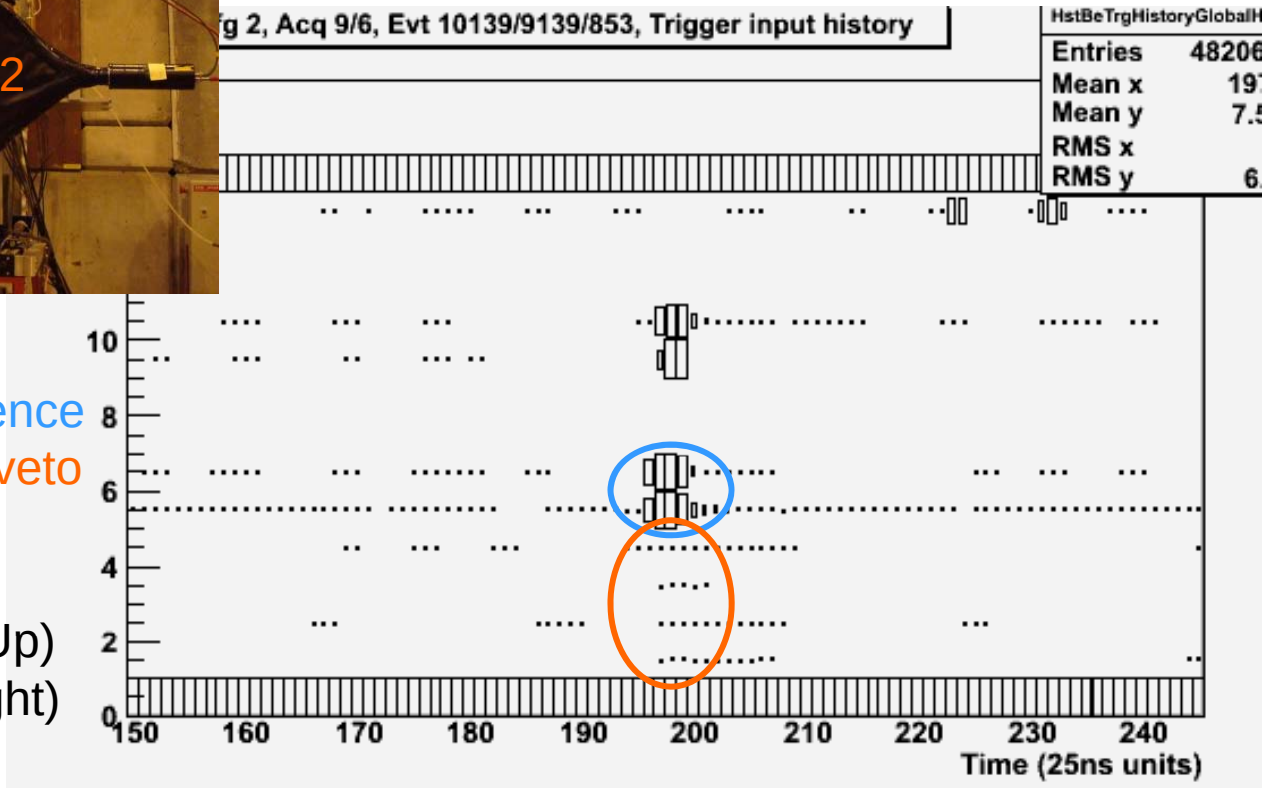
The outer veto



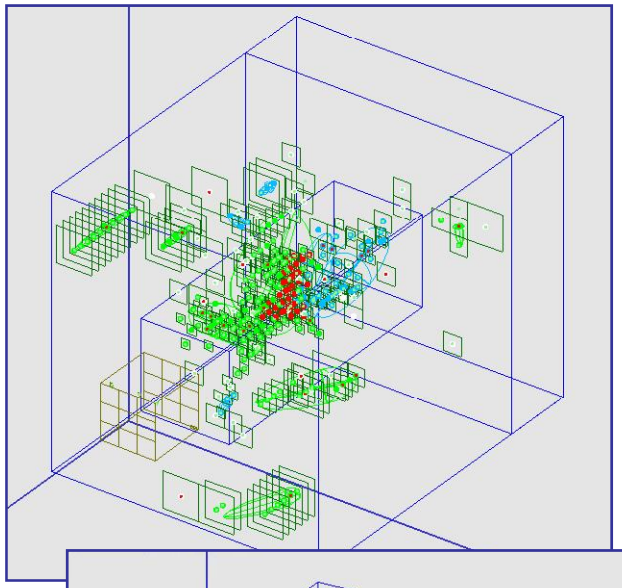
outer veto rate:
(C_1 || C_2 || C_3 || C_4) & (T_1 & T_2)
normally < 1-2%

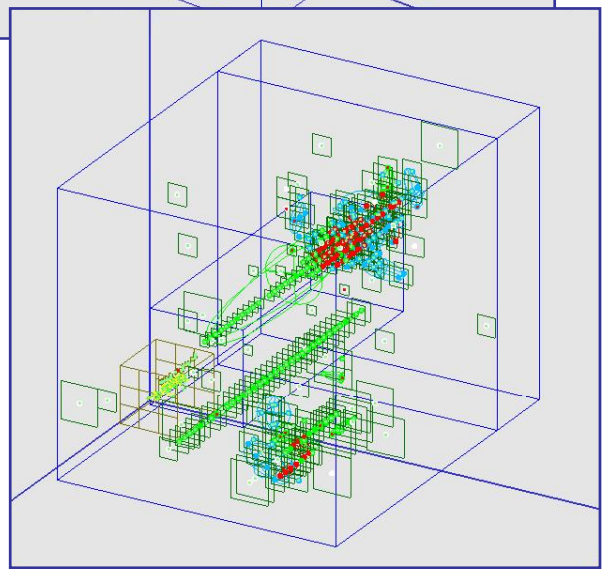
in binary files:
bit 5 & 6 = 10x10 trig coincidence
bit (1 or 2 or 3 or 4)&(5&6) = veto

in LCIO files:
isVetoXY(), X=D, U (Down, Up)
Y=L, R (Left, Right)

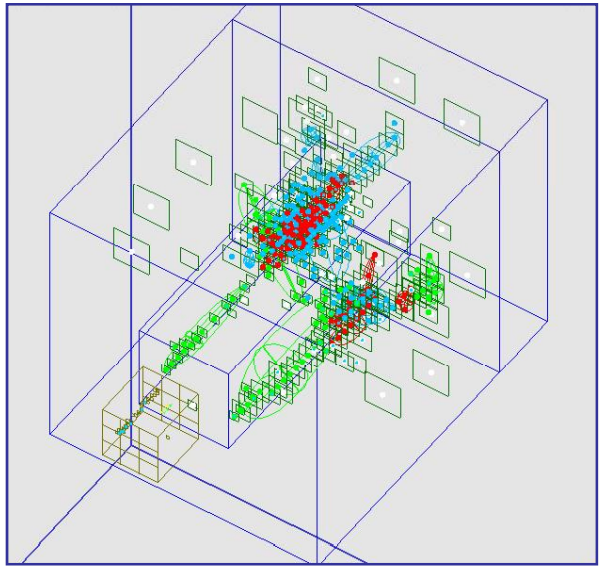


Clean-up examples



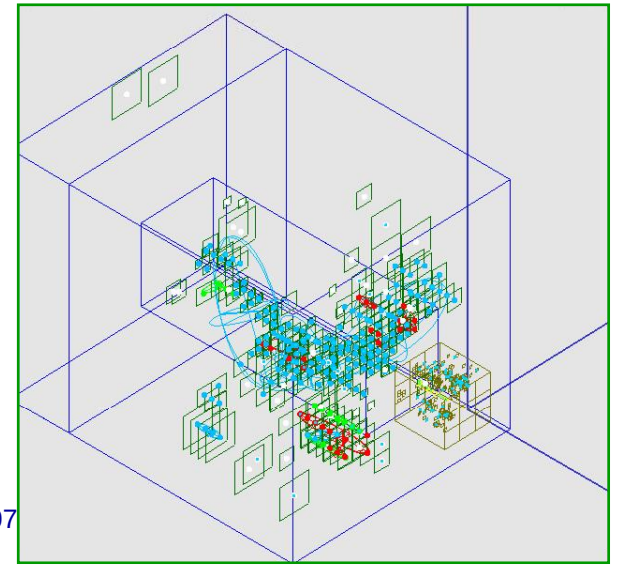


events cut by
no-outer-veto OR



maybe interesting event
selected (?!) with
outer-veto

events cut by inner-veto
Ampl<7000 ADC ch.



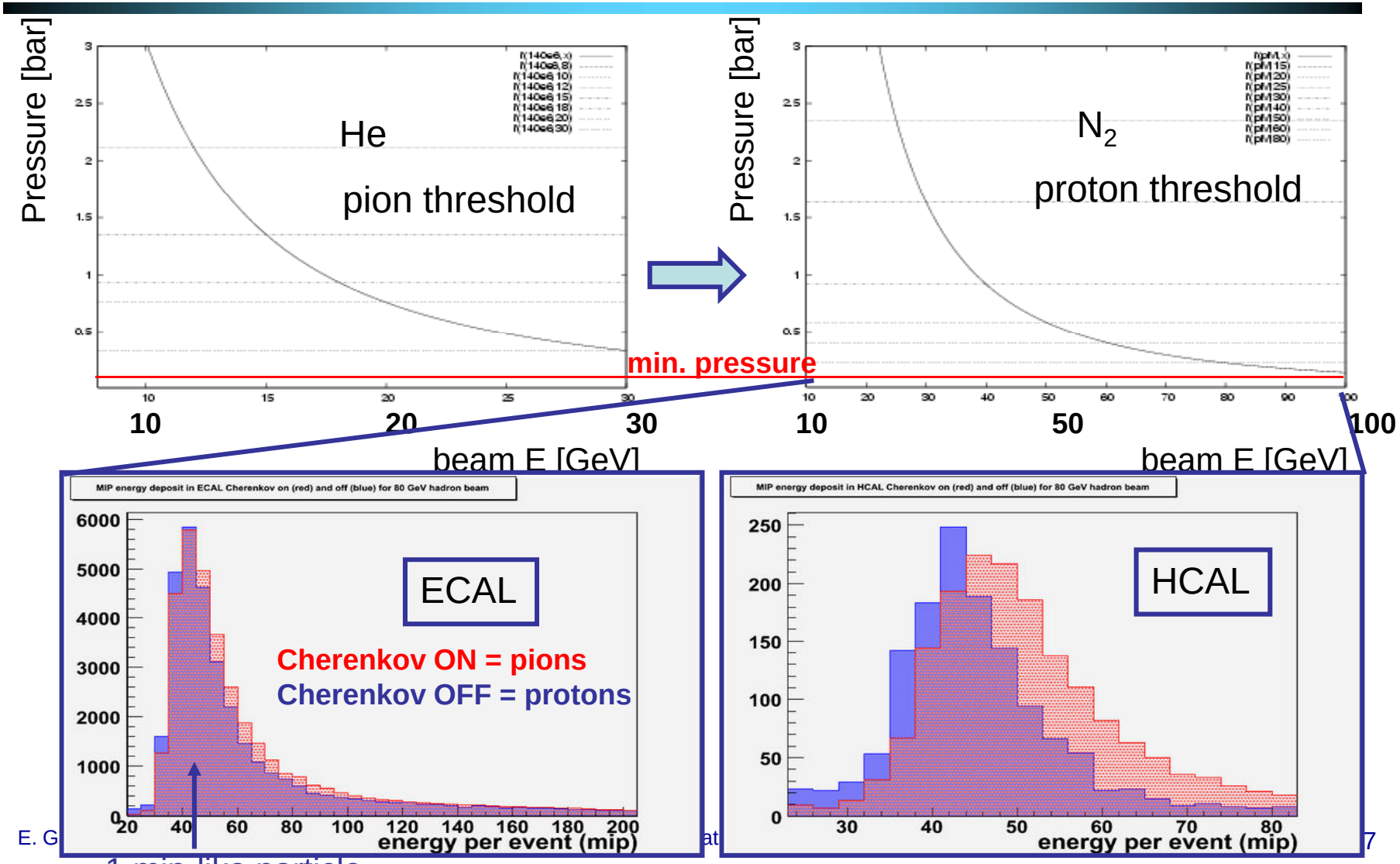
the Cherenkov counter

Cherenkov bit available from run 330250 on as bit 13 in binary files
isCherenkovTrigger() == 1 (0) for electrons (pions) in LCIO files

normally used for e tagging at E < 30 GeV

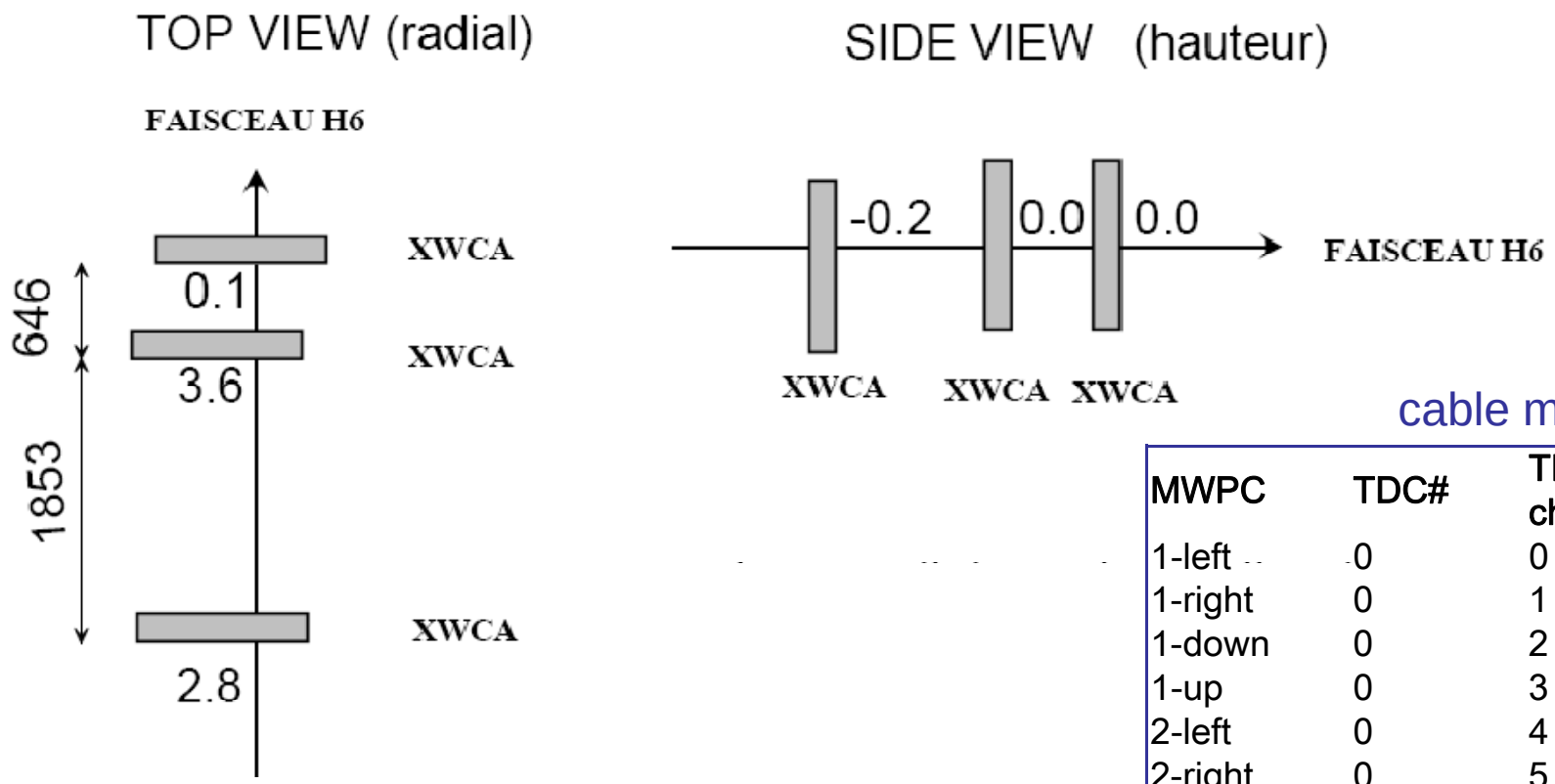
from run 331269 to 331463 the Cherenkov gas was changed from He to N_2
➔achieved p/pi separation
!!! for these runs
isCherenkovTrigger() == 1 (0) for pions (protons) in LCIO files

Pion/Proton separation



1 mip-like particle

MWPC alignment



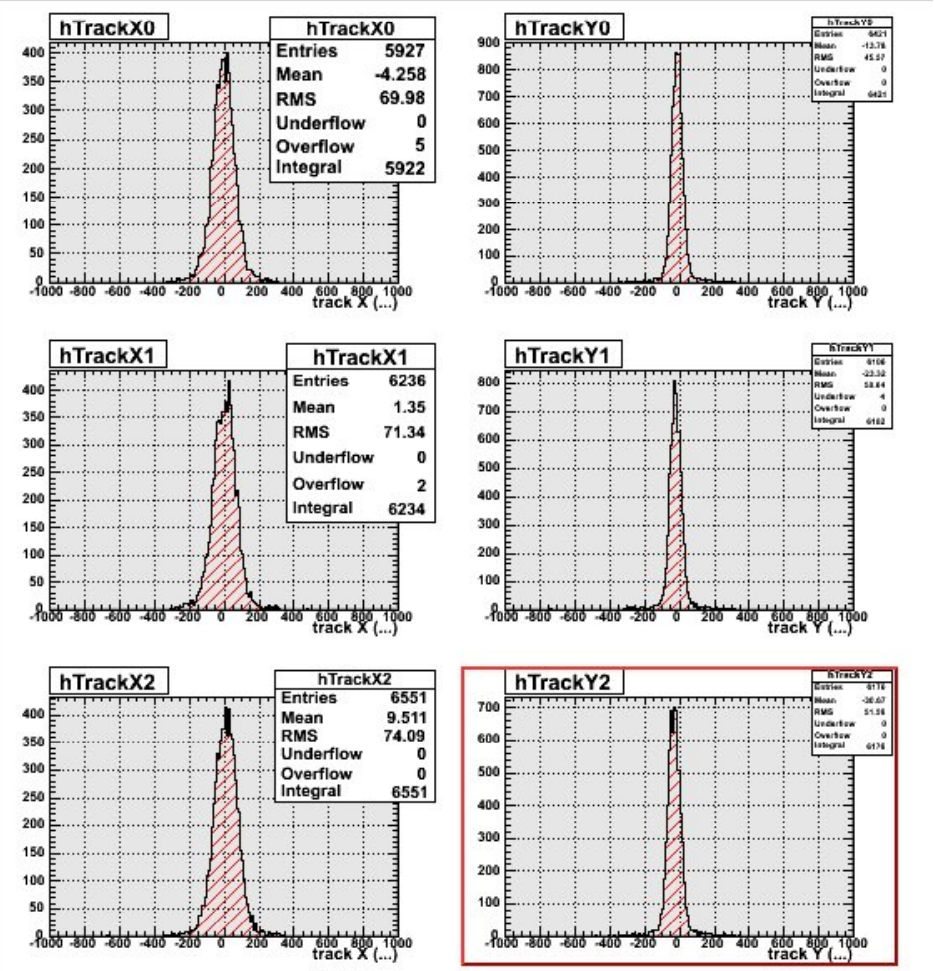
cable mapping

MWPC	TDC#	TDC channel#
1-left	0	0
1-right	0	1
1-down	0	2
1-up	0	3
2-left	0	4
2-right	0	5
2-down	1	1
2-up	1	0
3-left	1	2
3-right	1	3
3-down	1	4
3-up	1	5

alignment performed by CERN survey group

* all units in mm

MWPC performance



this year much better collimated beam also at low energy

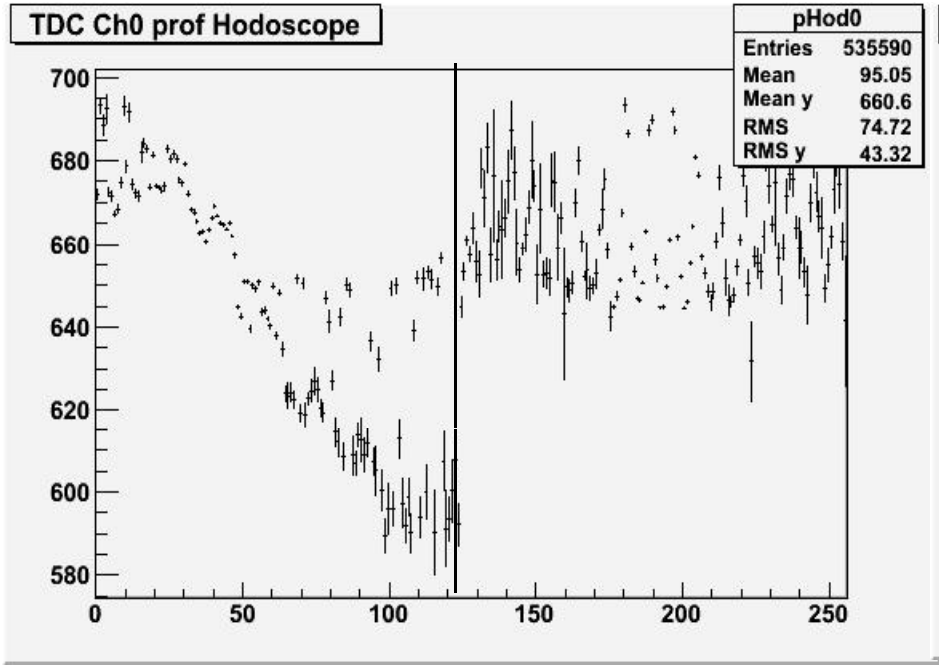
6-10 GeV still broad distribution

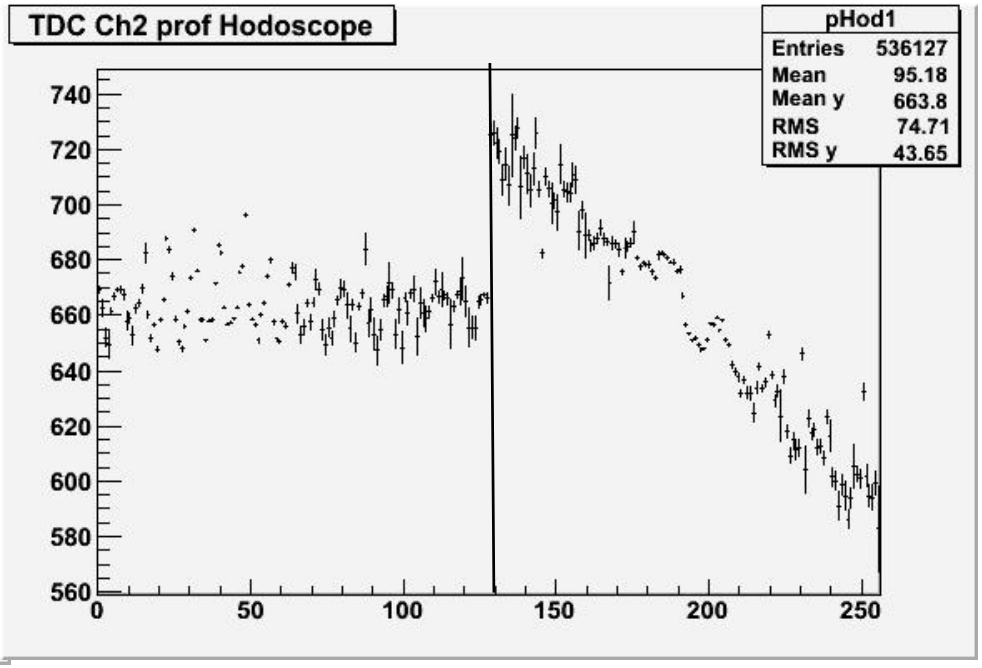
beam impact point tuned by shift crew
➔differences ~ 1cm from run to run

the hodoscope

provide 1 additional x-y point between last MWPC and ECAL

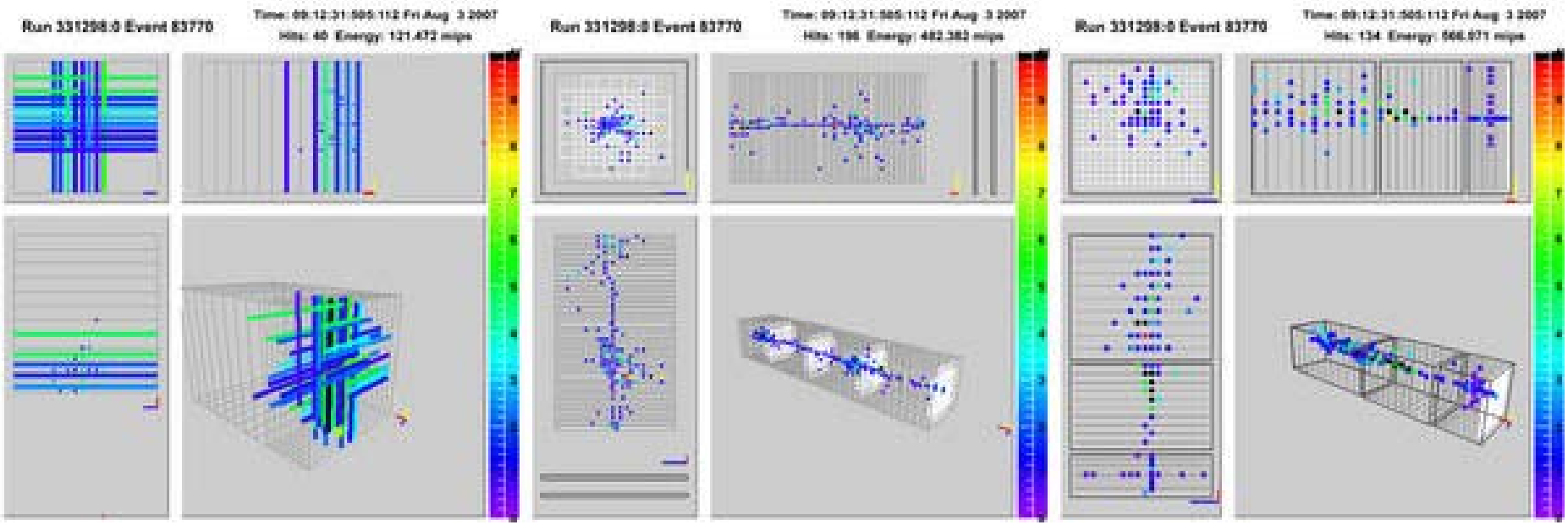
from run 331665 (14th August) readout from the DAQ





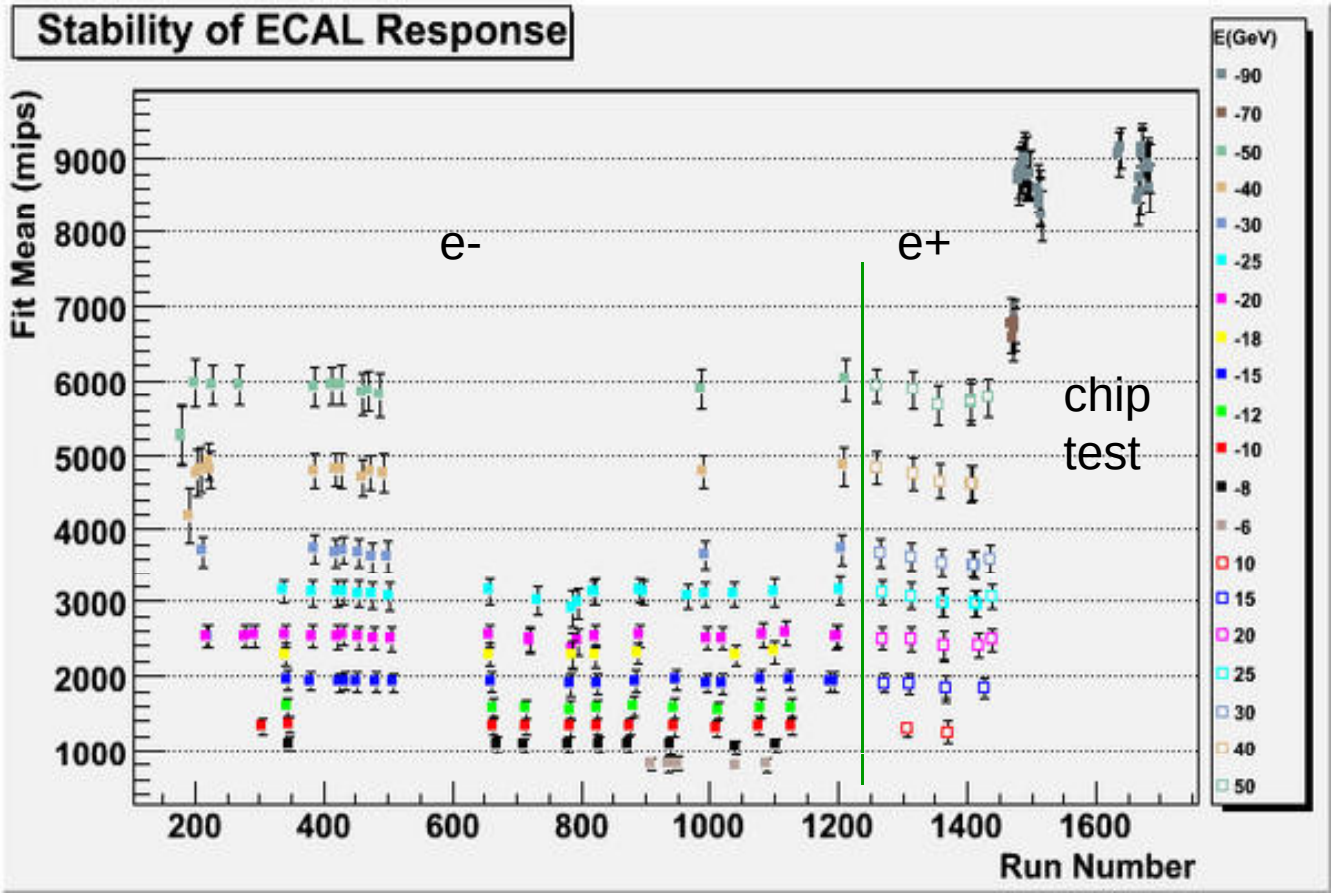
correlation hodoscope_X / MWPC_X and hodoscope_Y / MWPC_Y

Detector performance



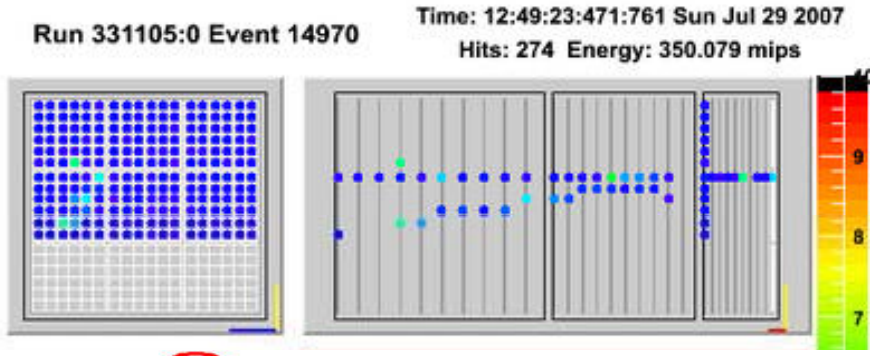
Total data taking time	7 weeks
SPS uptime	80.7 %
Beam controlled by H6B	76.1 % (94.4 % of uptime)
DAQ on beamData	60.2% (**79.1 %** of beam in H6B)
DAQ on calibration	7.8 %

ECAL response



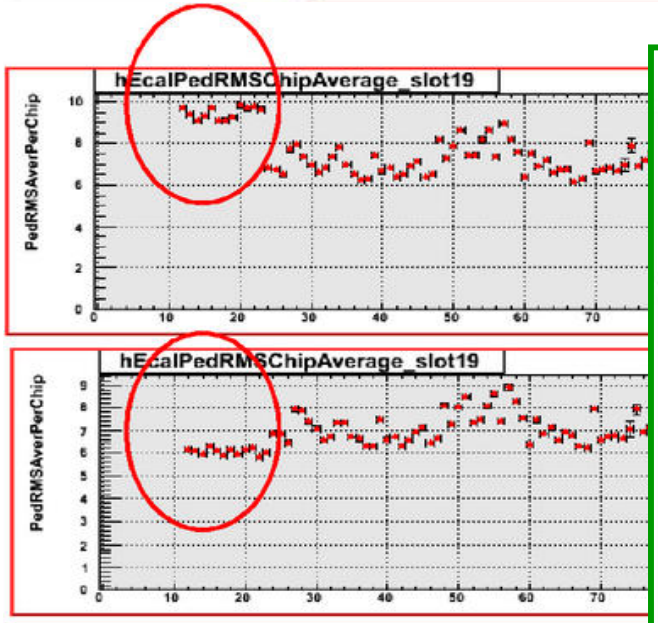
plots made on shift with online analysis tool (thanks Allister)
NO corrections applied

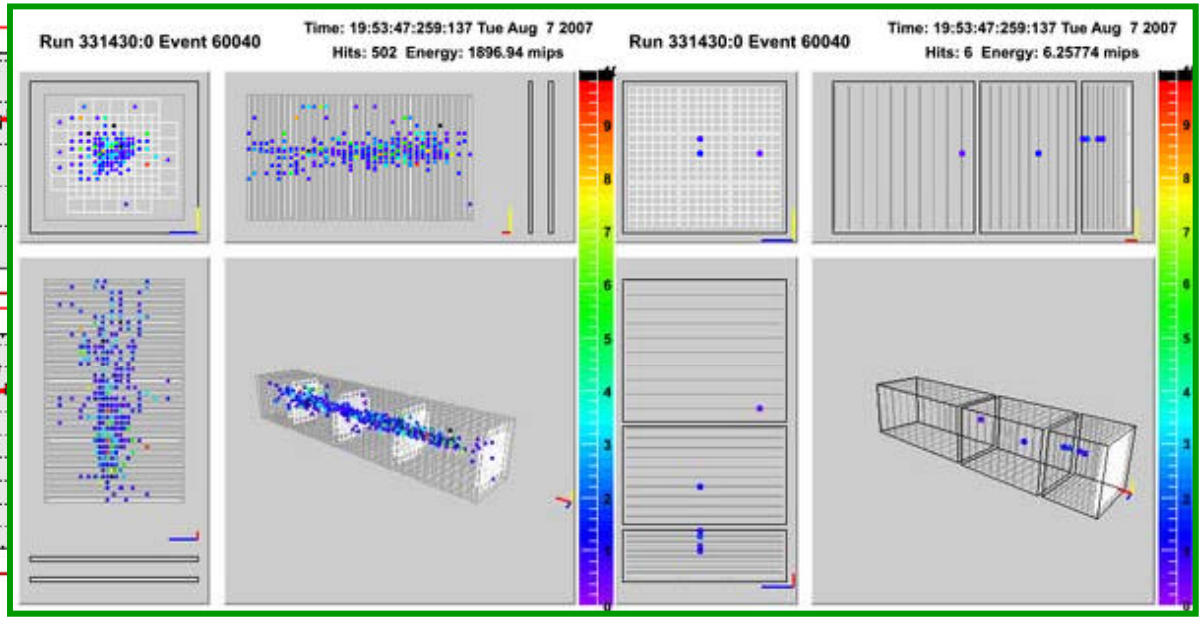
ECAL noise



known effects of noisy layers and pedestal fluctuations also this year

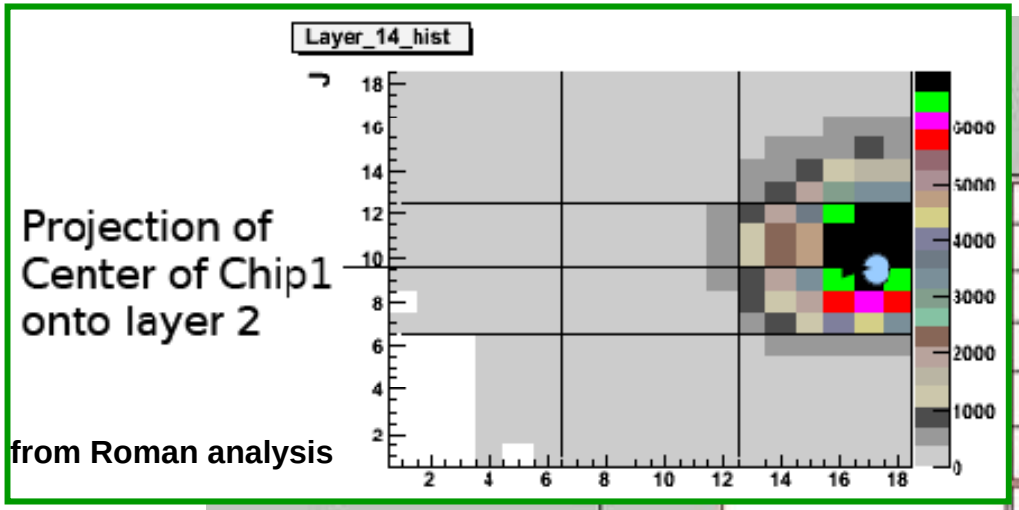
80GeV hadrons at ECAL (0,+3)
The hadron passes the ECAL (almost) undetected and generates showers in the HCAL
A gap effect?

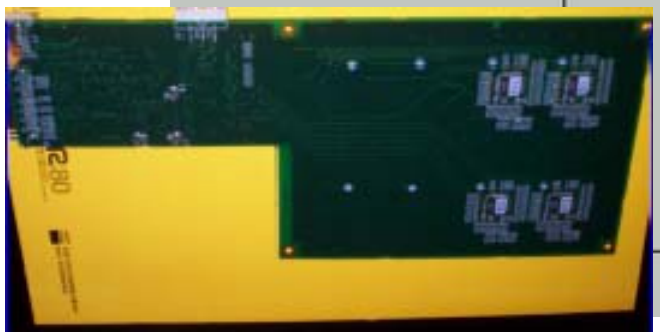




pedestal fluctuation during one run (slot 19, run 330774)

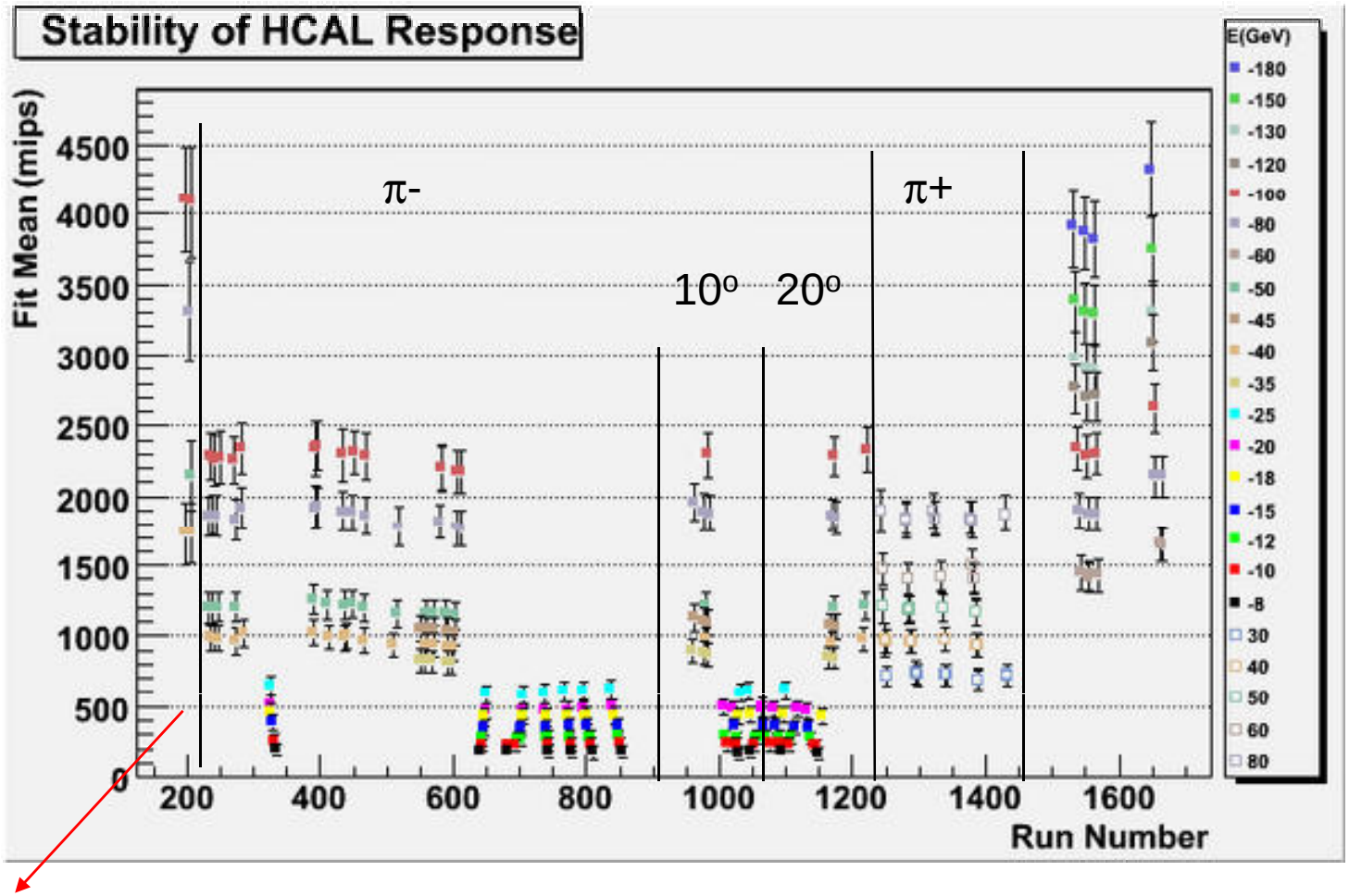
ECAL chip irradiation





5 position scan for each of the 4 chips on the special ECAL slab
-90 GeV electron beam used
~1.2 M events per chip

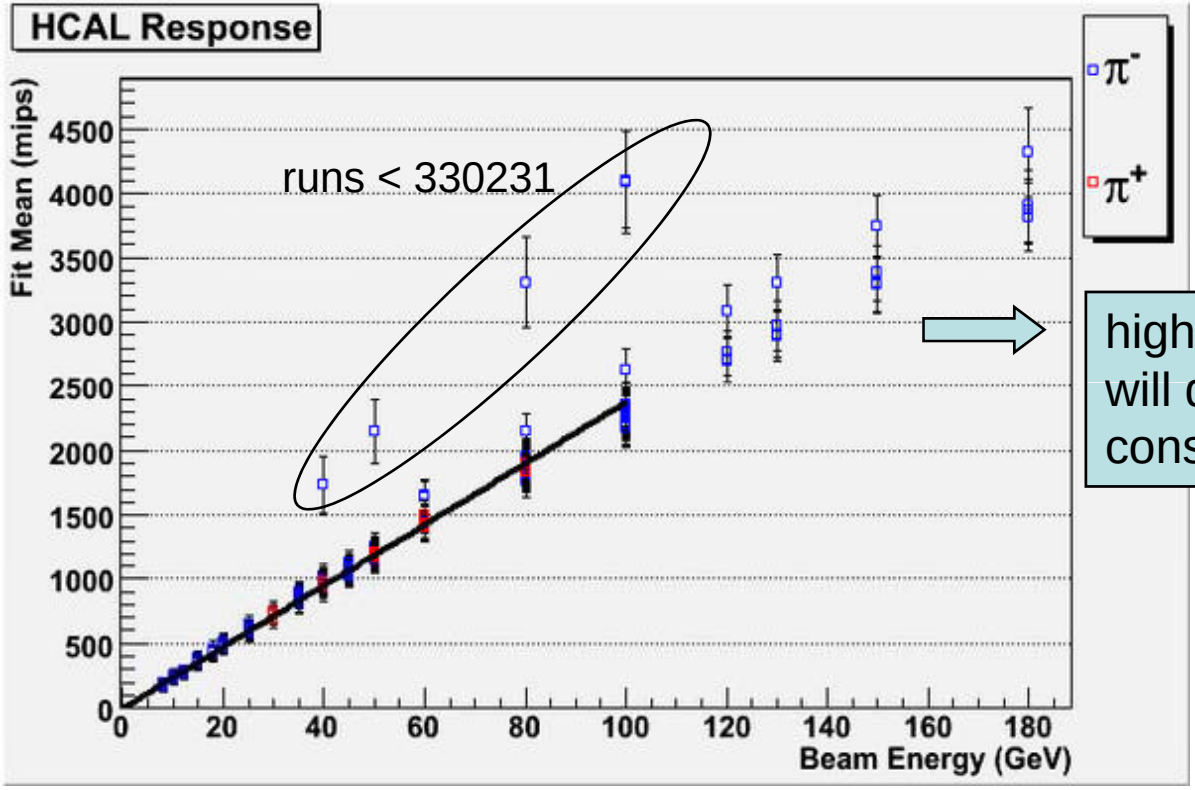
AHCAL response



runs < 330231 marked as odd HCAL longitudinal profile

plots made on shift with online analysis tool
NO corrections applied

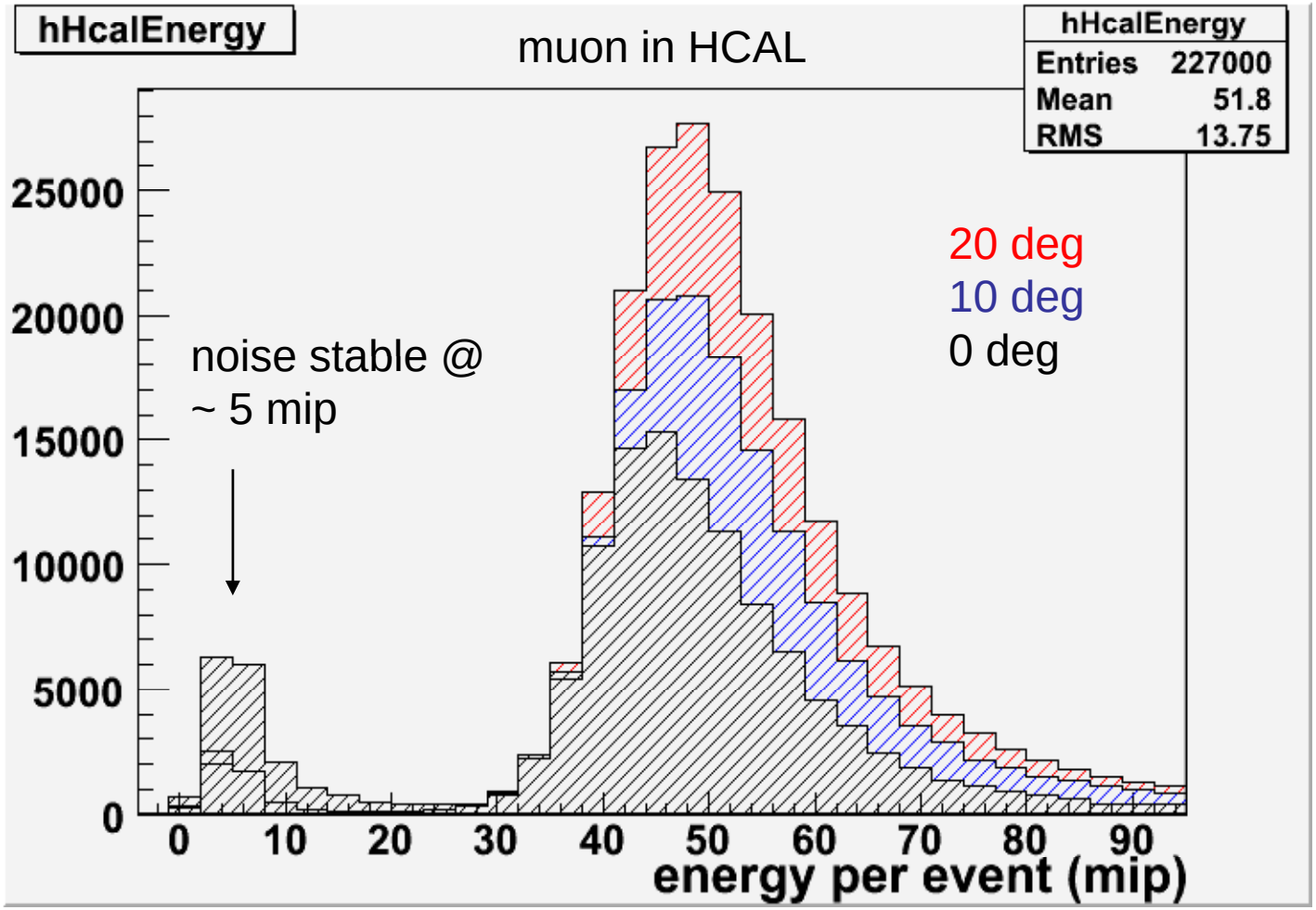
HCAL linearity



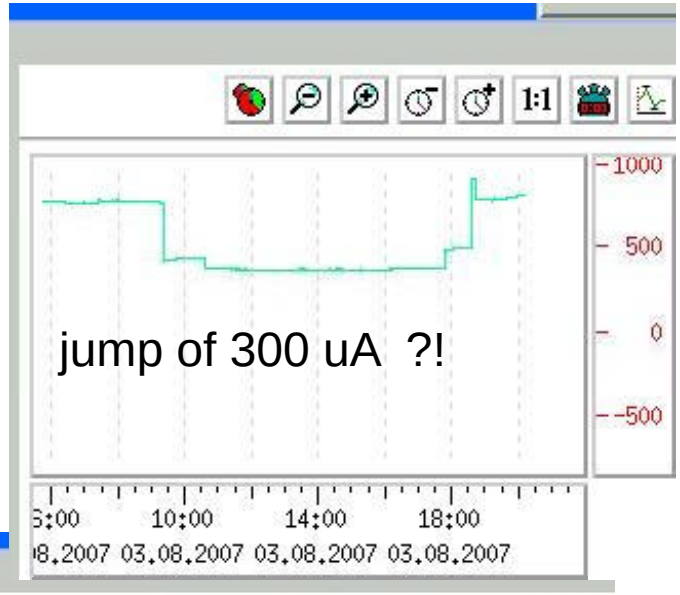
high energy points will determine the constant term

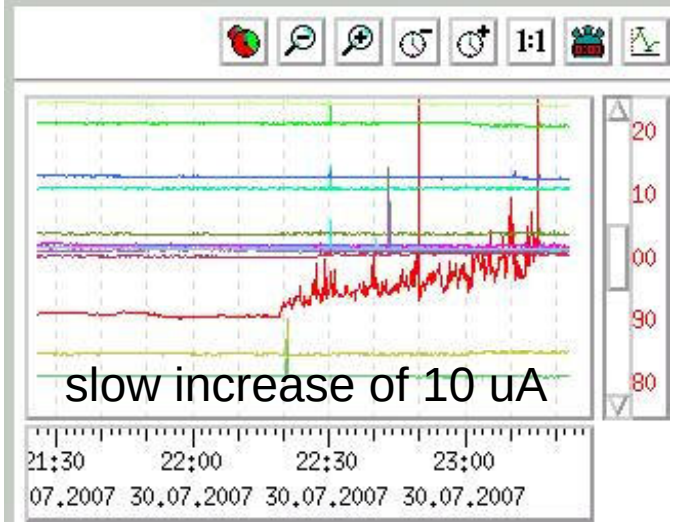
plots made on shift with online analysis tool
NO corrections applied

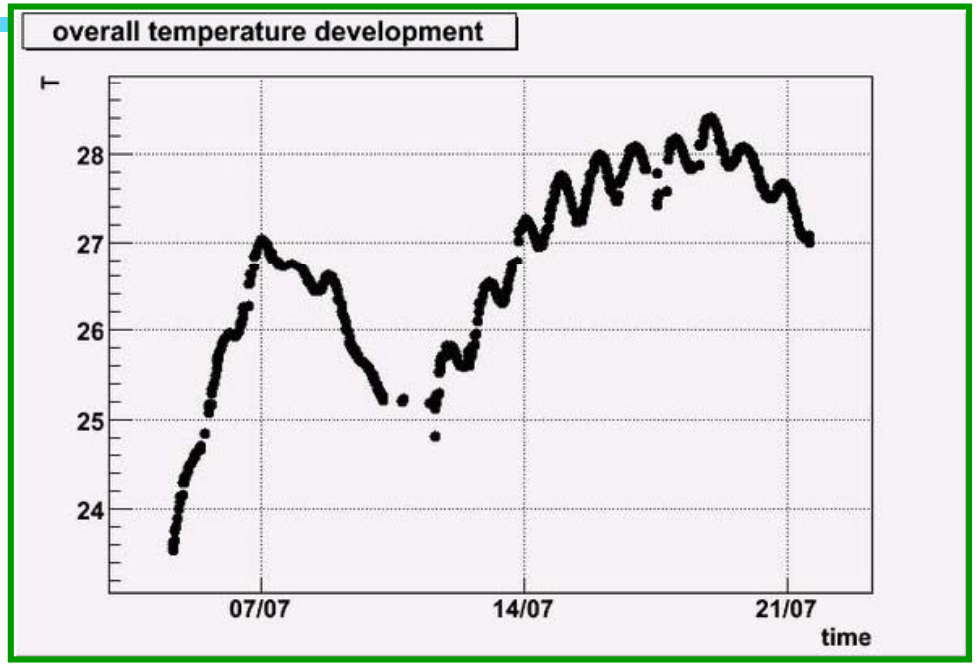
muon calibration



Current and temperature





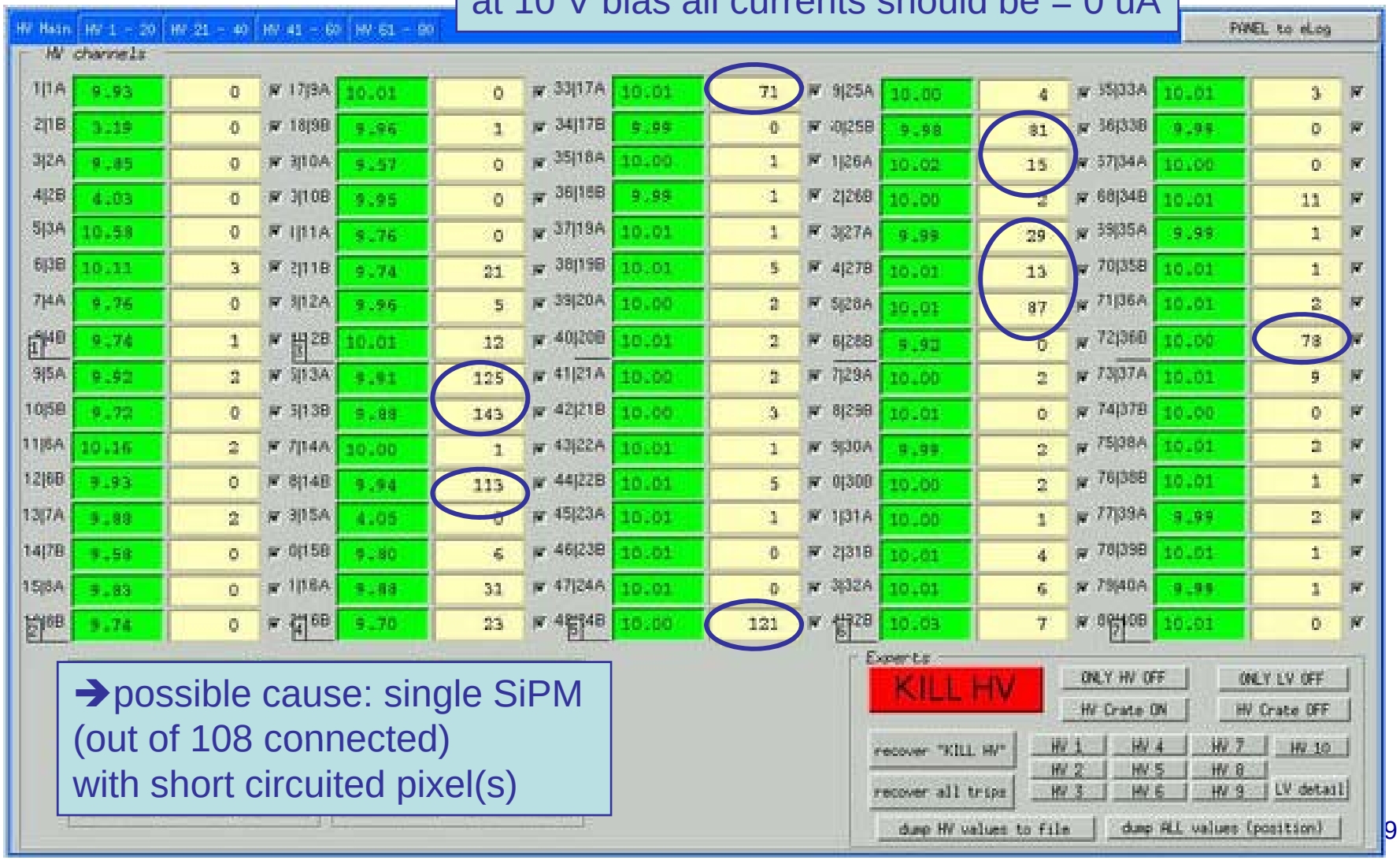


large temperature variations:
~ 0.5 K day-night
> 4 K over 3 weeks
➔ to be accounted in SiPM calibration

for some channels current limit was continuously increased over time ➔ study of ped RMS will tell if “radiation” damage is observed in SiPM

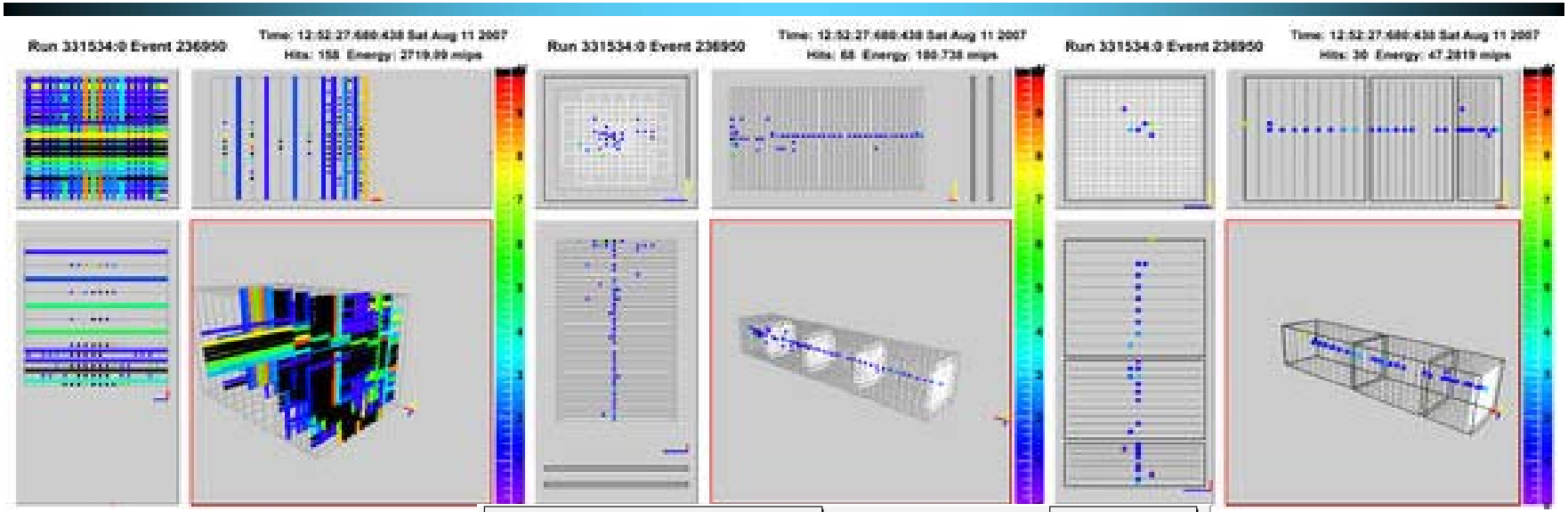
HCAL current map

at 10 V bias all currents should be = 0 uA



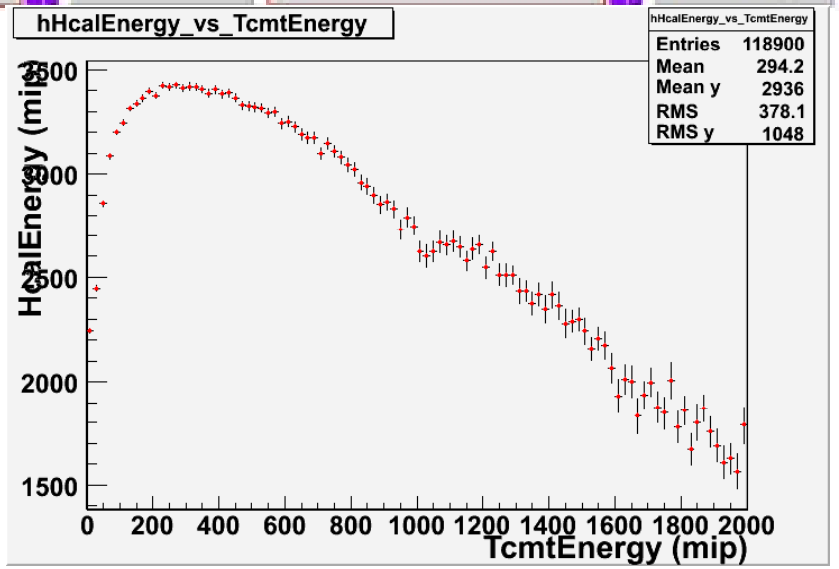
➔possible cause: single SiPM (out of 108 connected) with short circuited pixel(s)

TCMT



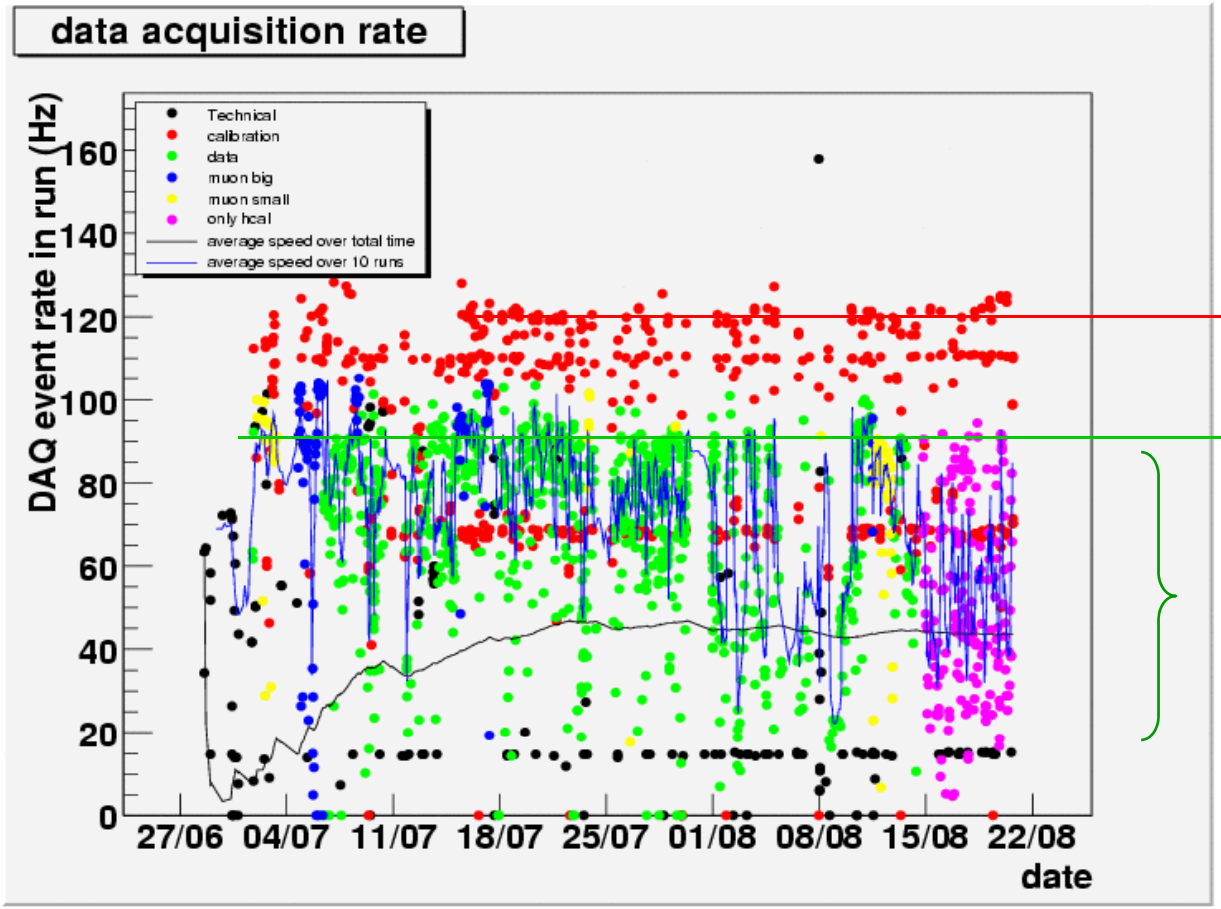
TCTM always operational

LED system was off after stage rotation



180 GeV pion strong HCAL-TCMT correlation

DAQ performance



120 Hz limit of DAQ out of spill

90 Hz limit of DAQ in spill

limited by beam rate

CALL EXPERT

DAQ disk space almost full

Conclusion

an amazing test beam success!

➔ thank you to all of you!

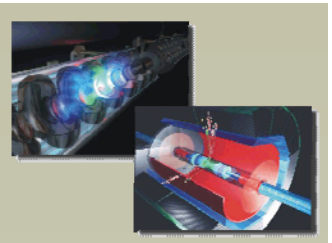
- now is our task to analyze ALL these data and make it a physics success!

- please join the analysis effort for:

ECAL, AHCAL, TCMT, combined data & MC comparison

- next we need to prepare for FermiLab…

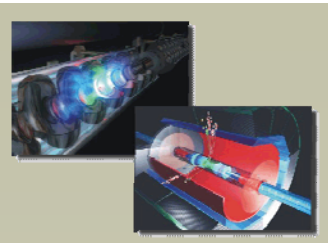
➔ short presentation on behalf of Sven Karstensen (DESY)



Remote control and monitoring of CALICE detectors @ FERMILAB

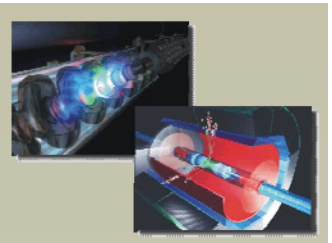
A proposal of control rooms and conferencing system around the world, tested at CERN-SPS in 2007

Prolog



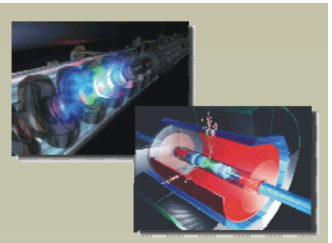
- For a worldwide collaboration like CALICE and a detector which has to be reached by experts at any time from everywhere, it's not a question IF we need a remote controlled system but more WHAT we should use. Here we like to give you a proposal of a complete solution.

The FERMILAB Site

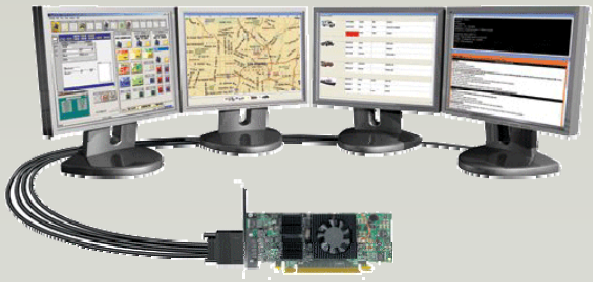


- Computer systems (Linux, Windows) are connected within the FERMILAB network and could be reached remotely (password, firewall and IP protected) via the redundant portal server array
- Web cams and microphones for videoconferences (control room area) are installed
- Remote controlled webcams and scope (detector area) will be accessible from everywhere

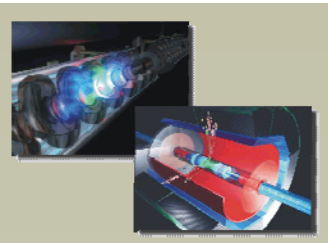
The REMOTE Site(s)



- PC for display the control panels on up to 4 displays with a JAVA enabled browser
- Simple webcams for videoconferencing
- Noise suppression microphones for conferencing
- Direct connection to FERMILAB control room



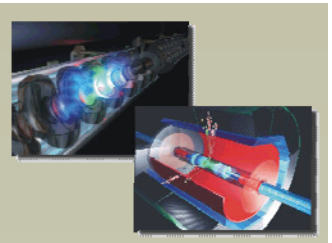
The Conferencing Tool

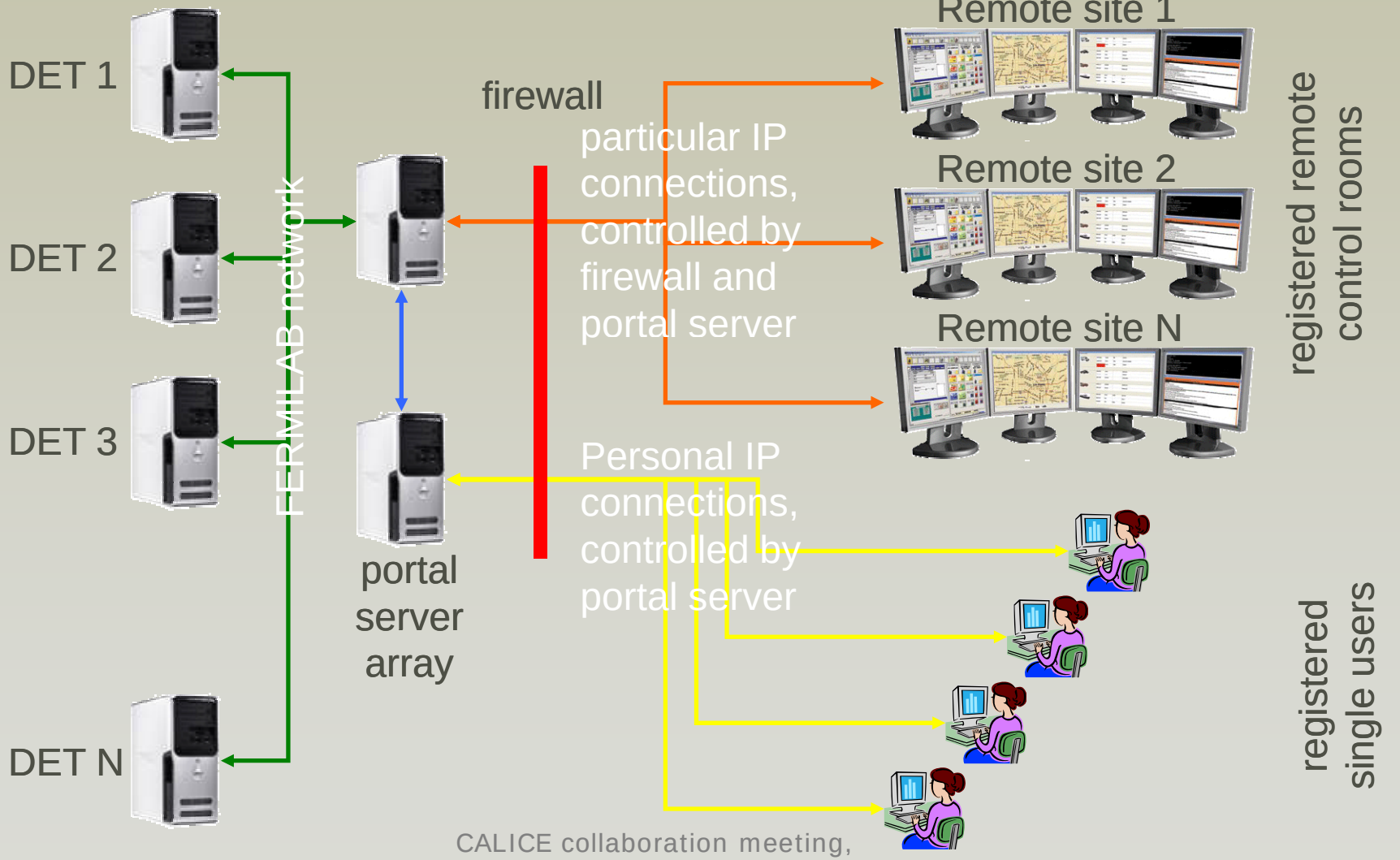


- As a first offer, before spending a lot of money for software licenses (webex), we like to use EVO as a conferencing tool. EVO is the successor of VRVS and developed by CALTECH. The first tests have been made by us successfully.

  http://evo.caltech.edu/evoGate

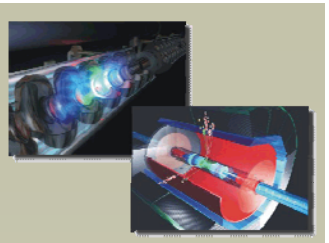
The Structure

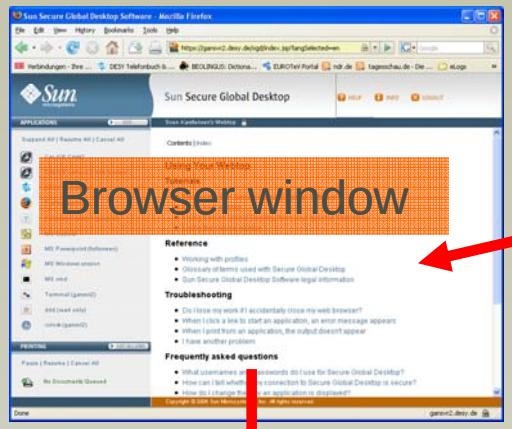


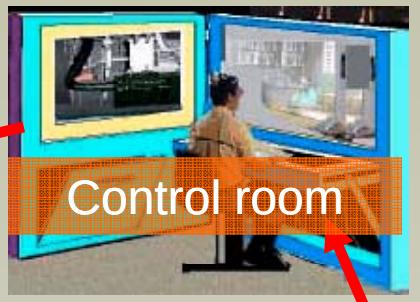


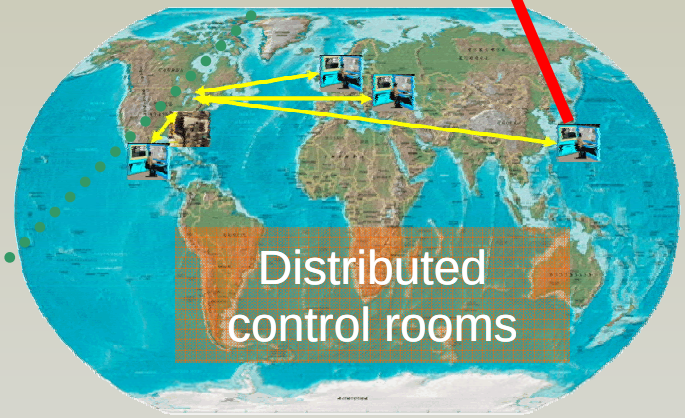
The Technical Details

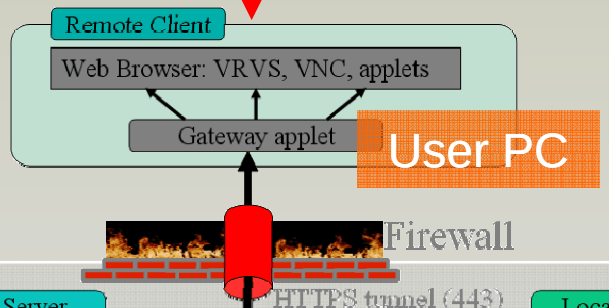
(for the interested user ;-))

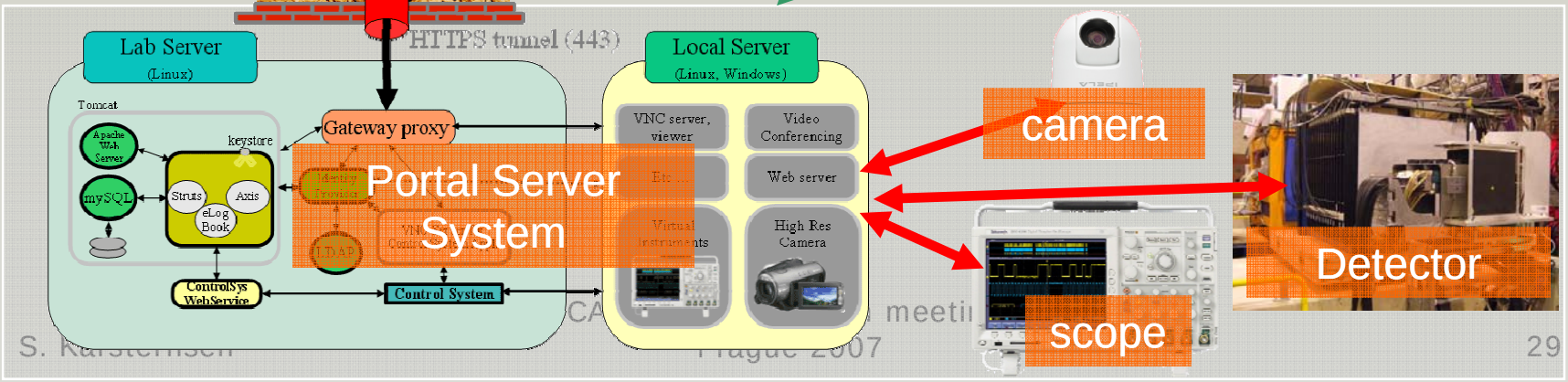


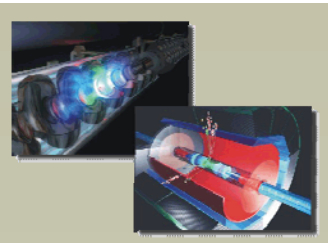












Thank you for your attention !