

Staus of High Level Trigger (HLT) for PHOS

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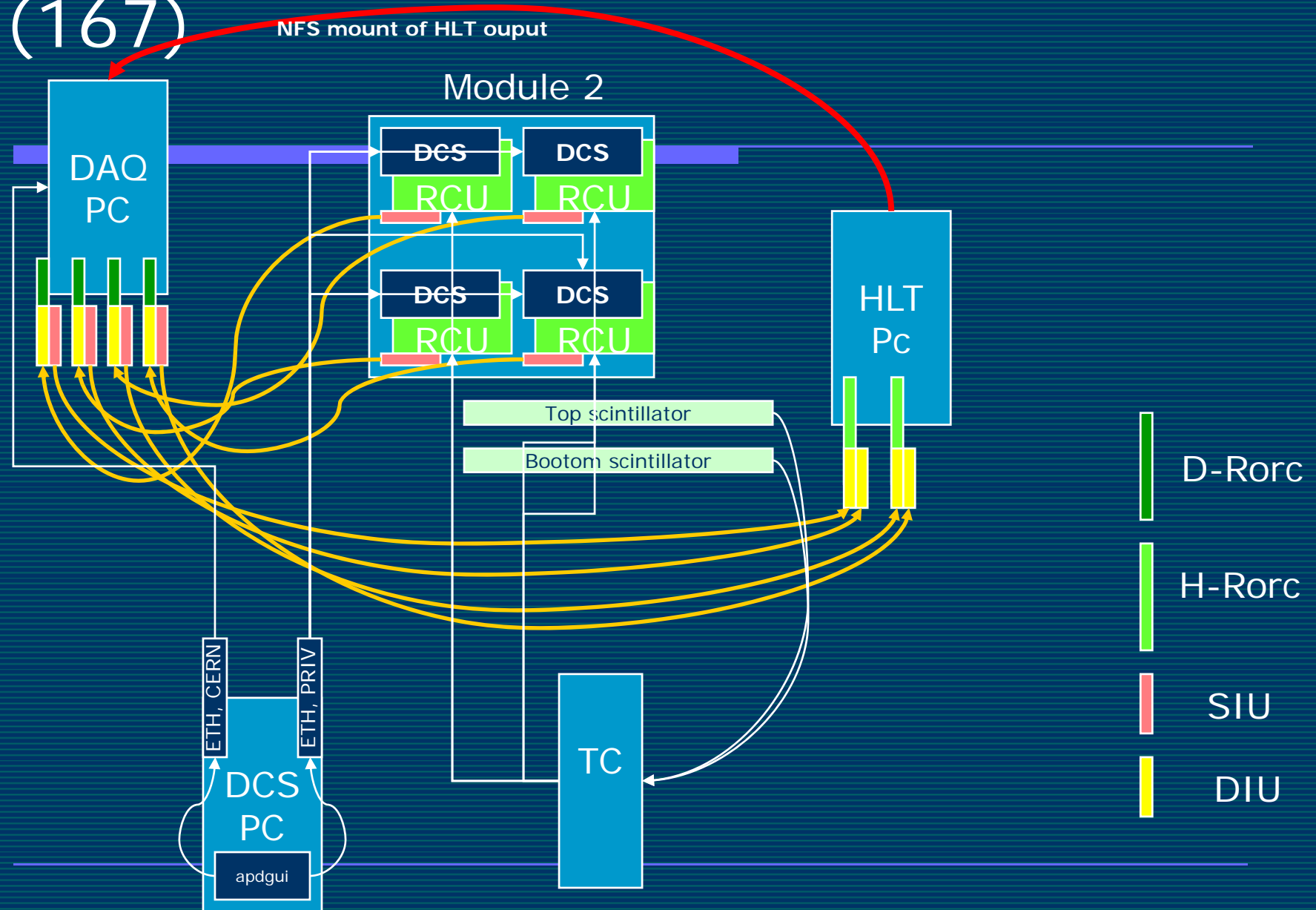
October 5th 2007

Current status

- The HLT for PHOS is fully operational and is currently in use for cosmic calibration in the PHOS lab.
 - Have moved from "Proof of principle" stage to be used as actual software trigger and real use for physics.
 - Online monitoring of events & calibration data.
 - Compression of raw data by a factor ~ 150 for cosmics.
 - Includes raw data for selected channels
 - Could compress by a factor ~ 5000 if only channel energies is written to file
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Current setup in the PHOS lab

(167)



Recent developments

- Online selection of channels with signal above user defined threshold.
 - Possible to attach raw data for offline comparison.
 - Raw data display is now synchronized with event display. Raw data can be displayed by double click with mouse.
 - Useful for debugging.
 - Improved calibration display with one to one correspondence between coordinates from apdgui and HLT
 - Easier to make out bad channels.
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Recent Development.. cont

- ❑ Writing of dead channel map (as root file) at end of run
 - ❑ Continuous writing/update of per channel energy histograms during run in addition to at the end of run command.
 - ❑ Online selection of MIP candidates & writing to file.
 - ❑ Trigger Scanner of over DCS
 - Uses the same DCS software as apdgui.
 - ❑ Online Data Quality Monitoring
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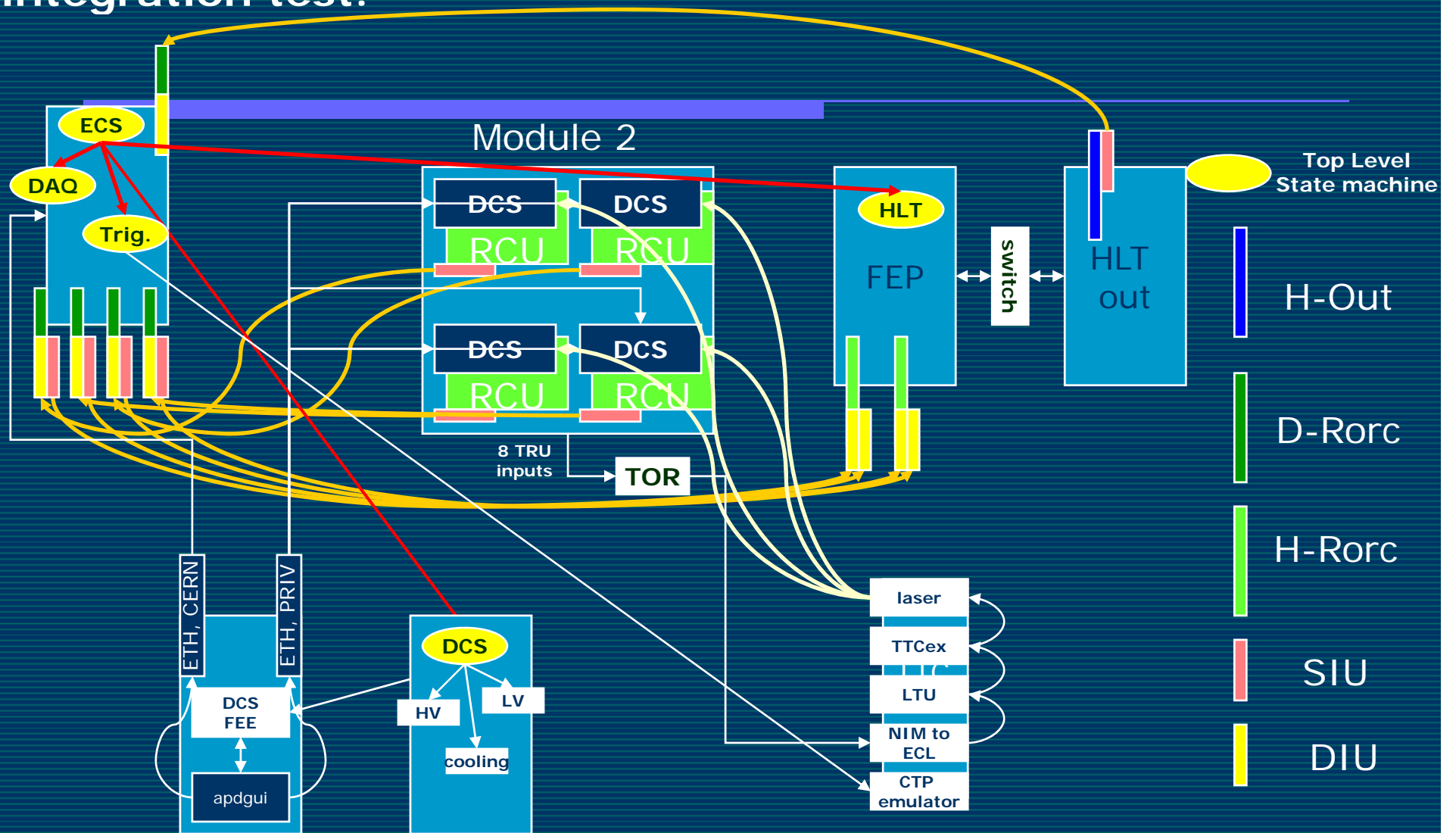
Issues

- Data displayd in the calibration histograms was shifted by +1 in z and x direction.
 - Reason: In ROOT bin zero is the underflow bin, and the counting of acuall bins starts therfor at 1. In software it was assumed that counting started at zero.
 - Consequence:
 - When attempting to masing out bad channles, good channels was masked out and bad one untouched.
 - We should go back to old APD configuration and start form there to mask out bad channels.
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Near future plans

- Isolated Mip Trigger in HLT
 - Speeds up offline analysis of cosmic calibration data.
 - Control of DAQ, DCS, TRIGGER & HLT via ECS, (next slide).
 - Synchronizes data taking between DAQ and HLT.
 - Increases the number of people that can operate the system.
 - Currently users are forced to interact with four different systems. The synchronization between these systems should be taken over by ECS.
 - Installation of HLT-Out in the PHOS lab
 - Allows for automatic synchronization of data between DAQ and HLT.
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Planned setup in the PHOS lab (167), mid October 2007 for ECS/DAQ/HLT/DCS integration test.



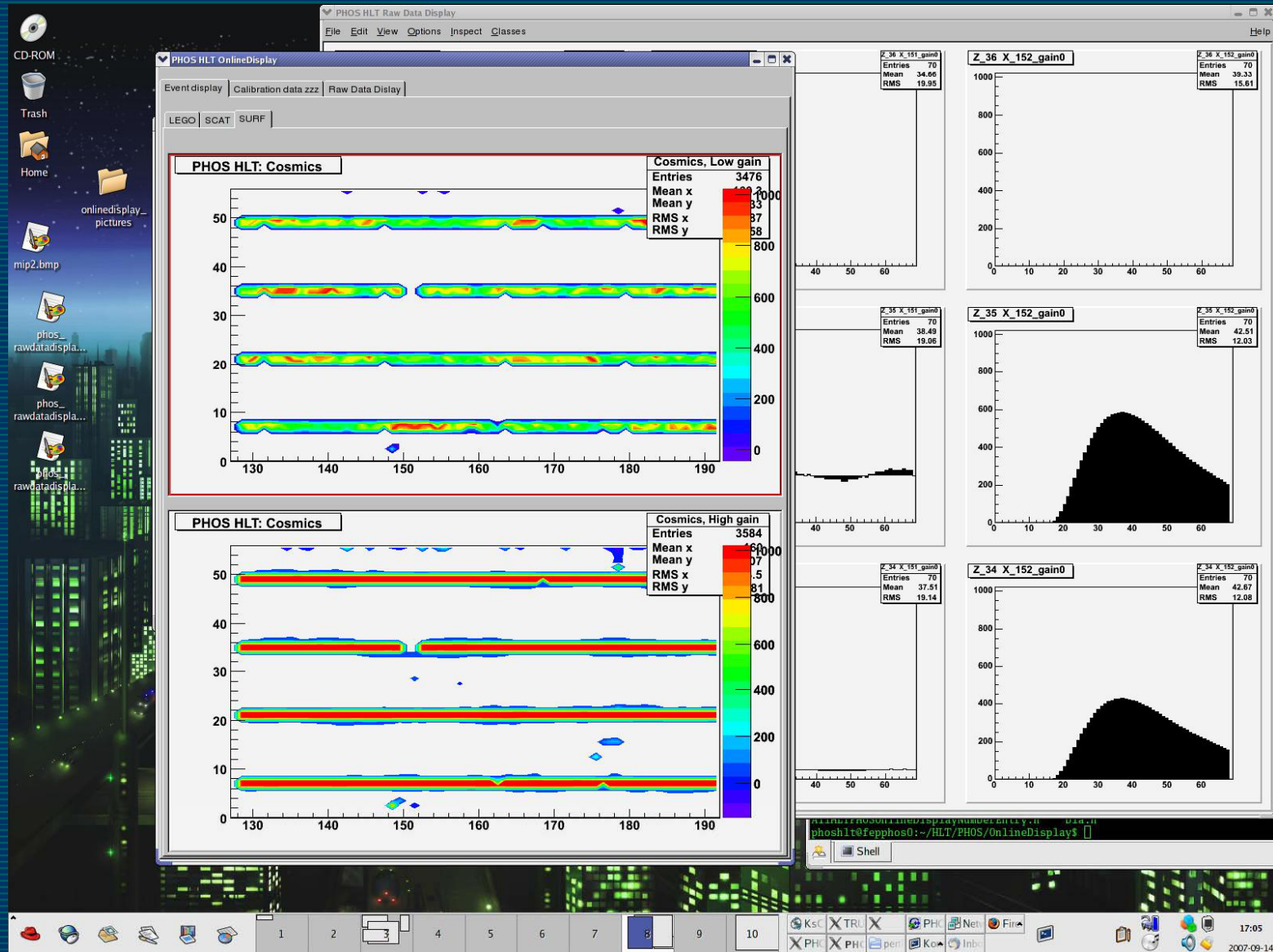
Near future plans.. cont

- Including the Online Clusterizer (Øystein) in HLT
 - The code exists and is working but we are not yet using it Online.
 - Some more testing offline before plugging it into the HLT.
 - Mip Clusterizer
 - Fast clusterizer intended for MIPS
 - Implemented and tested offline, but has yet not been tested online.
 - Faster than general clusterizer, but gives only 5x5 clusters, and doesn't resolve overlapping showers.
 - Should run online and offline on HLT output data.
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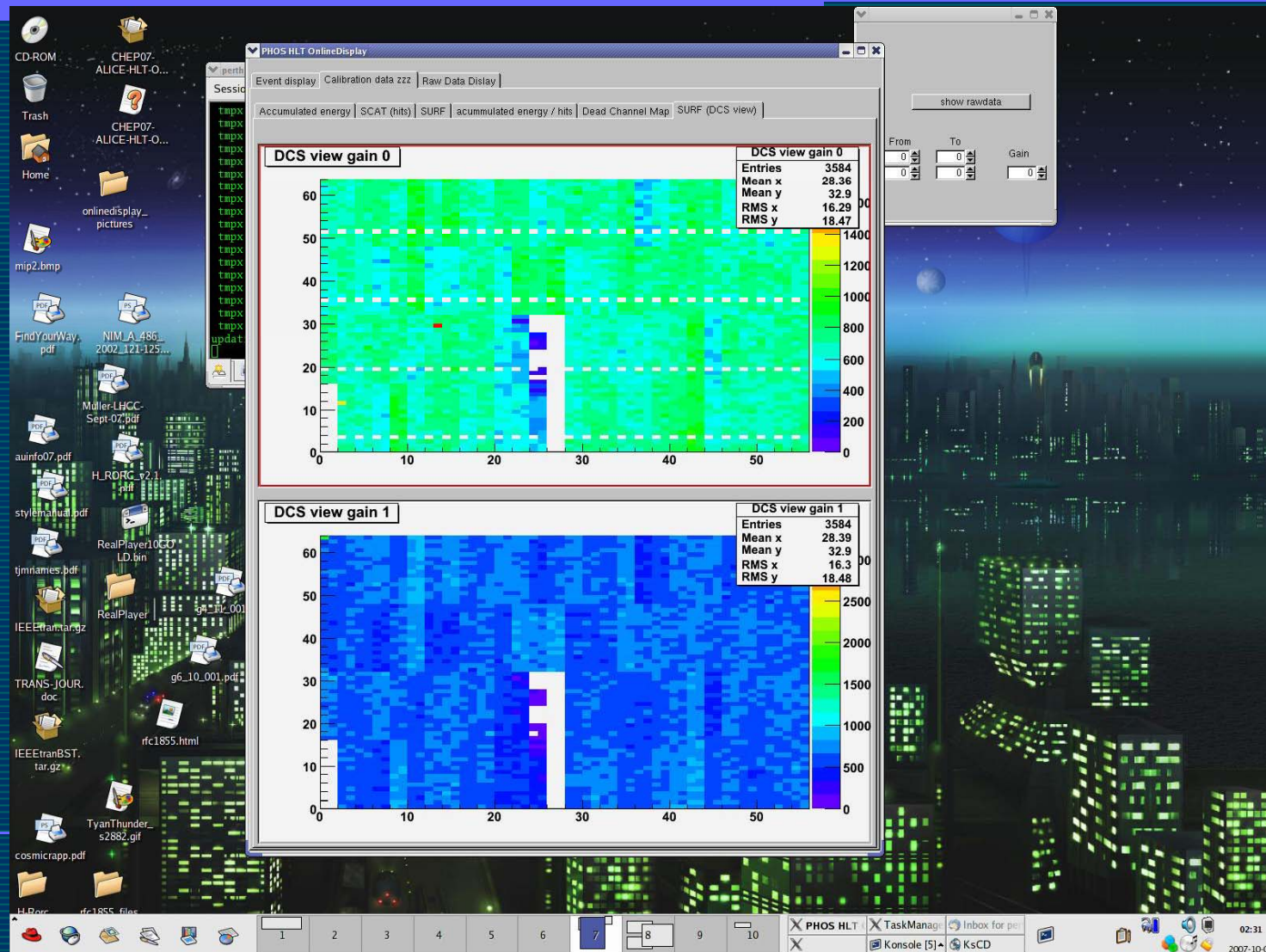
HLT, Picture show

All pictures taken online with the HLT

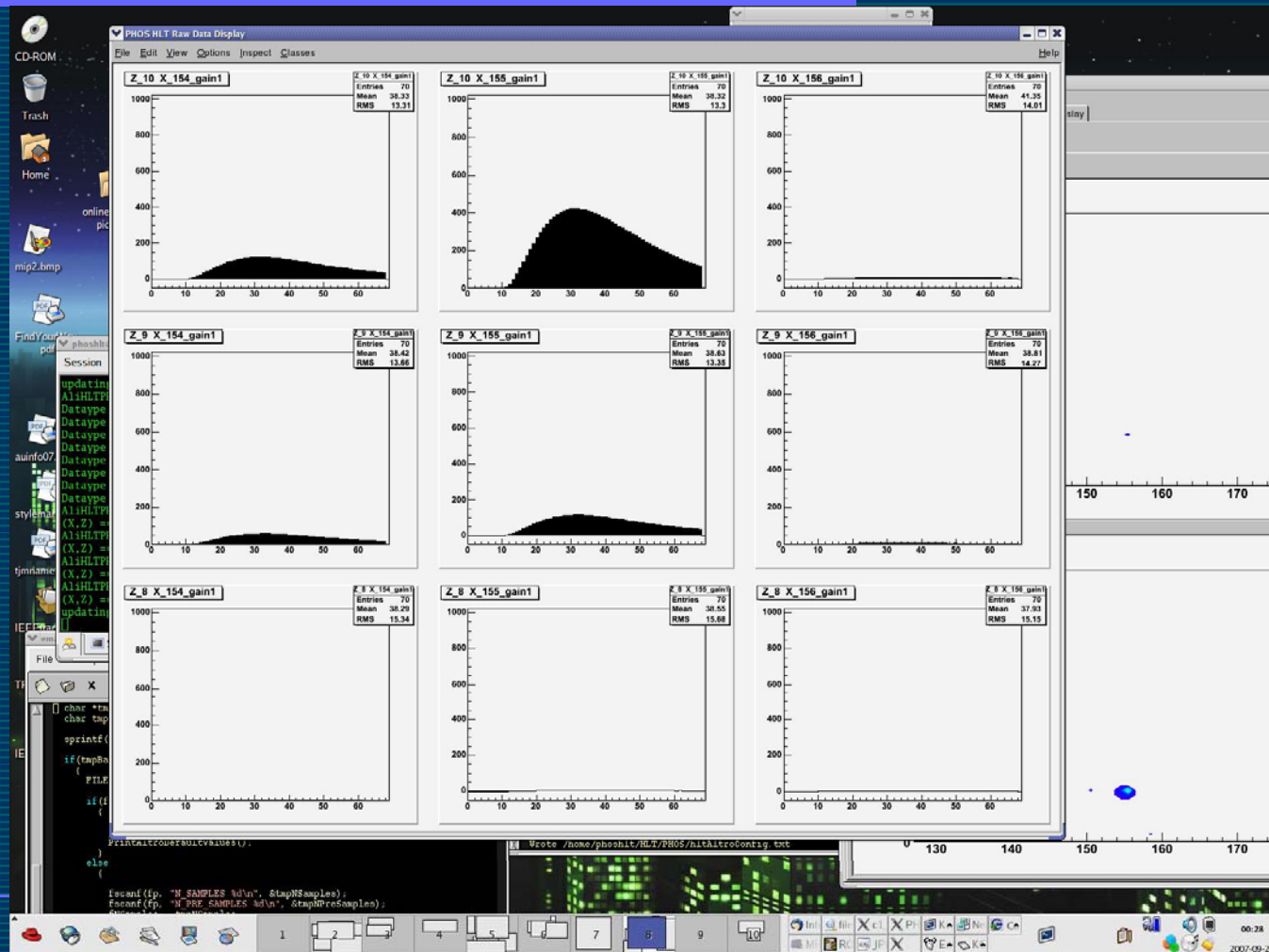
LED event, surface plot



DCS view of calibration histograms



Cosmic



Pi0 ?

The screenshot displays a Linux desktop environment with several windows open. The primary window is 'PHOS HLT OnlineDisplay', which shows two 3D histograms of 'PHOS HLT: Cosmics' data. The top histogram is for 'Cosmics, Low gain' with 2920 entries, showing a distribution of points in a 3D space. The bottom histogram is for 'Cosmics, High gain' with 3008 entries, showing a similar distribution but with more prominent peaks. To the right of the 3D plots are three 2D histograms labeled 'Z_7 X_144_gain1', 'Z_6 X_144_gain1', and 'Z_5 X_144_gain1'. A terminal window in the foreground shows the command 'killall onlinedisplay'. The desktop background features a cityscape at night. The system tray at the bottom indicates the time is 14:32 on 2007-09-24.

Gain	Entries	Mean x	Mean y	RMS x	RMS y
Low gain	2920	11.6	106	180	13
High gain	3008	115.1	200	87	24

LED event 2, lego plot + raw data

