

CaloMonitoring Status and Plans

CaloMon Group

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- Goal : fast feed-back on quality of fully reconstructed CaloCells, Clusters/Towers for physics running
 - effects of dead/hot/noisy channels from DSP running on trigger in (eta/phi) view
 - status of inputs to jet/ E_T^{miss} /e/ γ , allow correlation: clusters/towers \leftarrow jet constituents (sensitive to noise description + cell calibration)
- Weekly joint discussion CaloMonitoring/Jet Monitoring/group working on Jets Clustering and Cells (JCC)

Infrastructure for online and offline DQ

- Configurations for DQ assessments and displays were updated and working for May Cosmics data taking
- DQM online
 - **new online config** (simple 1d tests for CaloCells and CaloTopoClusters- no impact on LAr DQ flag.). Proof of principle: **simple to update available skeleton.**
- DQMF offline
 - **configuration available**, but logic still unreliable. **Examples of evolving new DQ logic in CaloCells and CaloClusters talks.**
- OHP: plots all **available** and browsable.

Strategy

- CaloClusters/CaloTowers

- contribute to jet/ E_T^{miss} DQ

- LAr CaloCells:

- contribute to LAr DQ and its relation with the Trigger

- contribute to jet/ E_T^{miss} DQ

- ▶ 2d occupancy with $|E_{\text{cell}}| > 4\sigma_{\text{DBnoise}}$ (cluster seeds)

- contribute to e/ γ DQ?

CaloGlobal DQ
assessment
(flag)

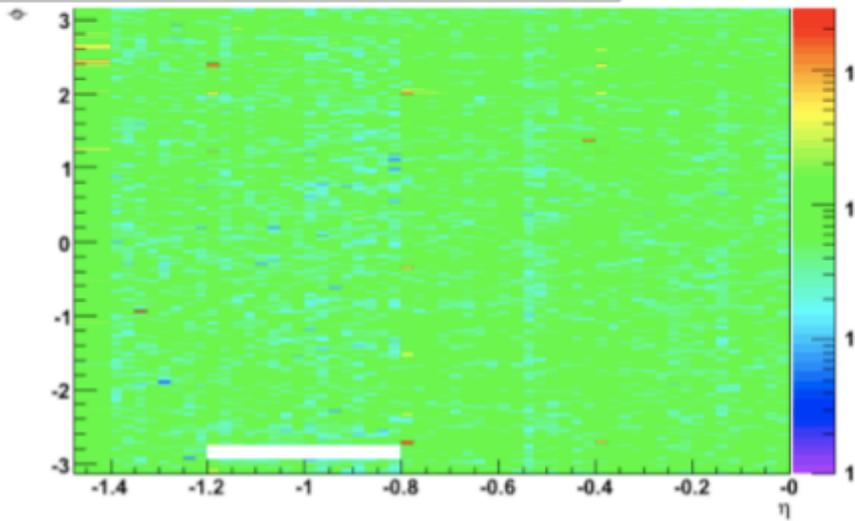
- contribute to jet/ E_T^{miss} DQ

- info from both calorimeters

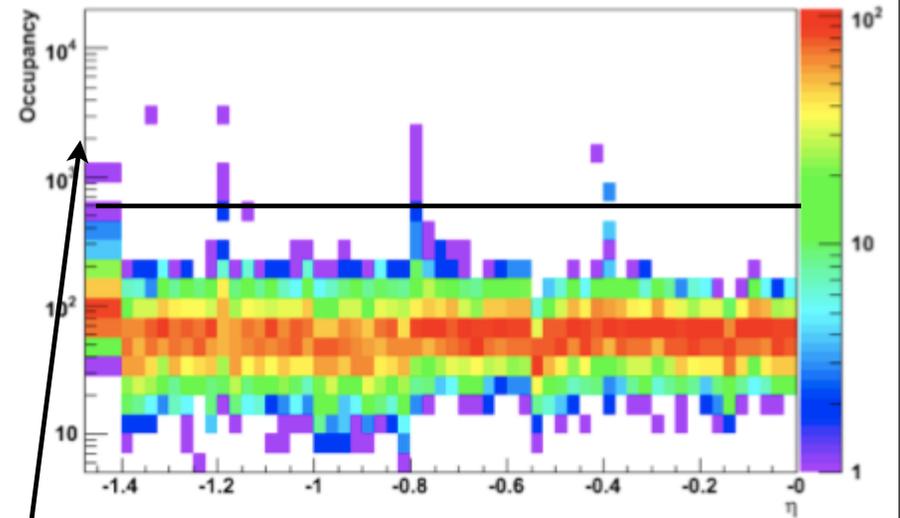
- ▶ maybe no need for entry in COOL folder as flag can be directly used by CP groups

DQ for Cells

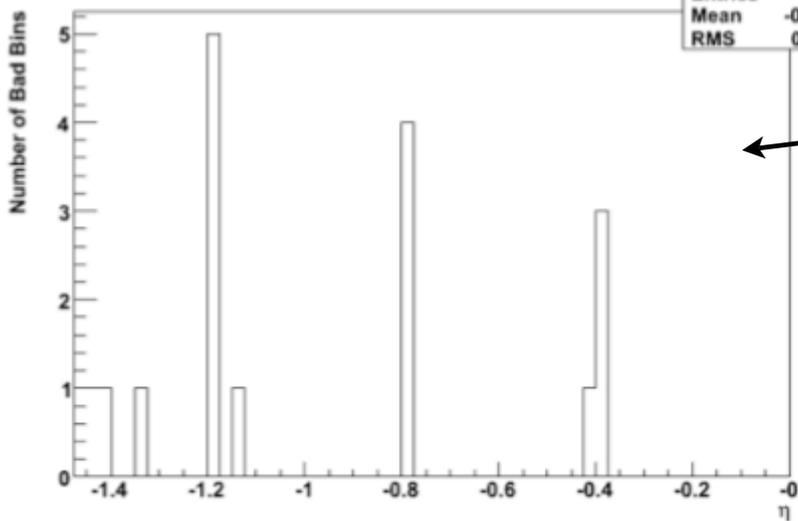
No. of events in (η, ϕ) in EMB2C - $E_{\text{cell}} > 3\sigma_{\text{noise}}^{\text{database}}$ - Masked



Cell Occupancy vs η



Number of Bad Bins Found in η Slice

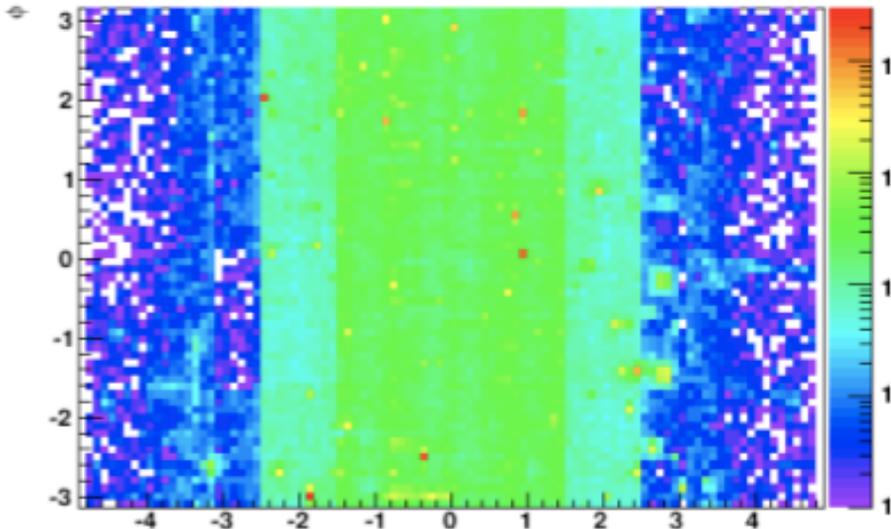


nbadbins	
Entries	16
Mean	-0.9109
RMS	0.3557

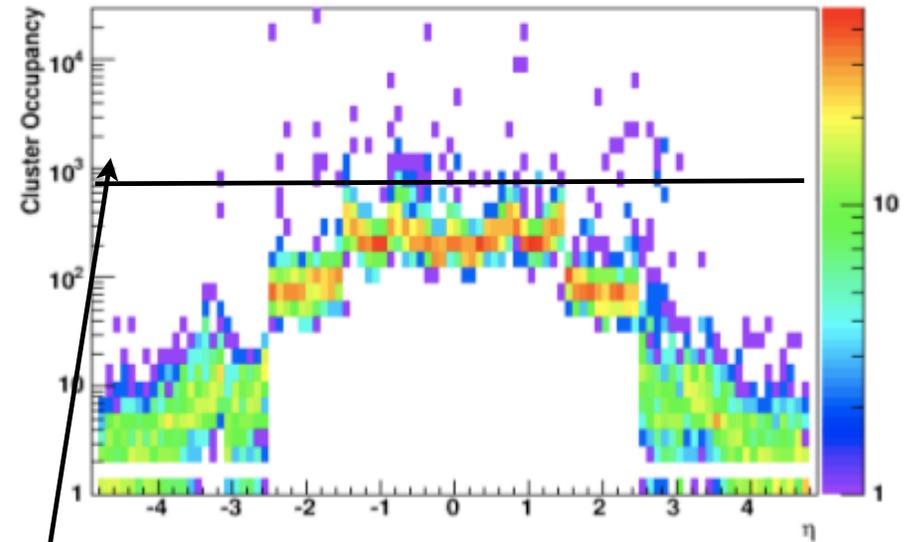
High Occupancy
Cells found in
iterative process

DQ for Clusters

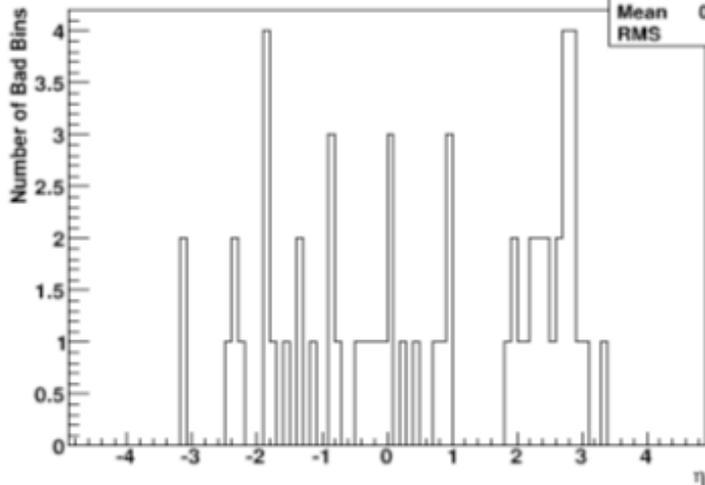
Hit Map of cluster with Energy > 0.0 GeV



Cluster Occupancy vs η



Number of Problematic Bins Found in η Slice

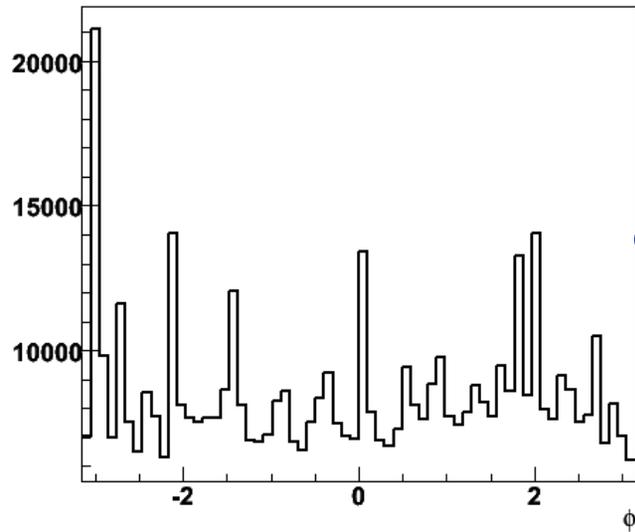


nbadbins	
Entries	59
Mean	0.5788
RMS	1.928

High Occupancy Clusters found in iterative process

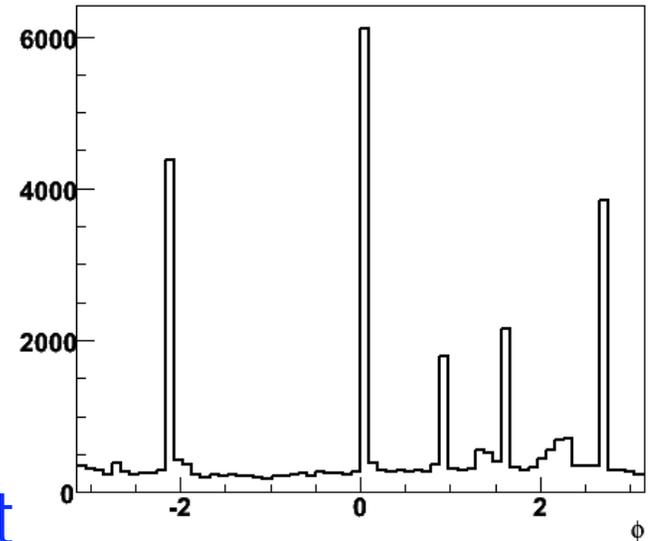
Cosmics Reprocessing

Phi Energy > 0.0 GeV Oct 08 CaloTopo



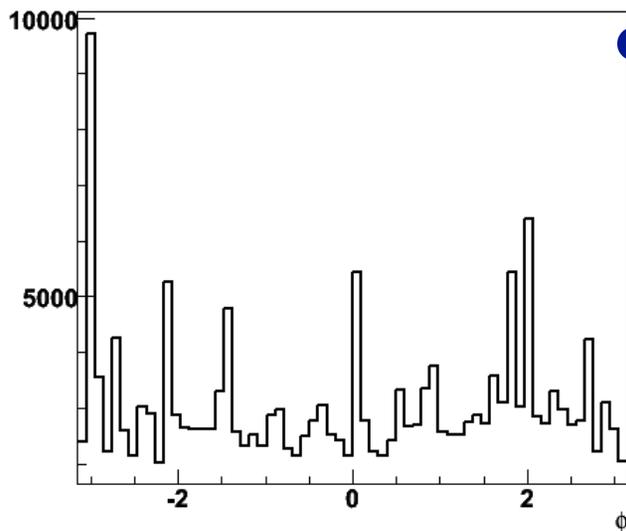
Run 91890, 1/physics_L1CaloEM
/CaloMonitoring/CaloCalTopoCluster/Occupancy/m_clus_phi0

Phi Energy > 0.0 GeV Oct 08 EMTopo



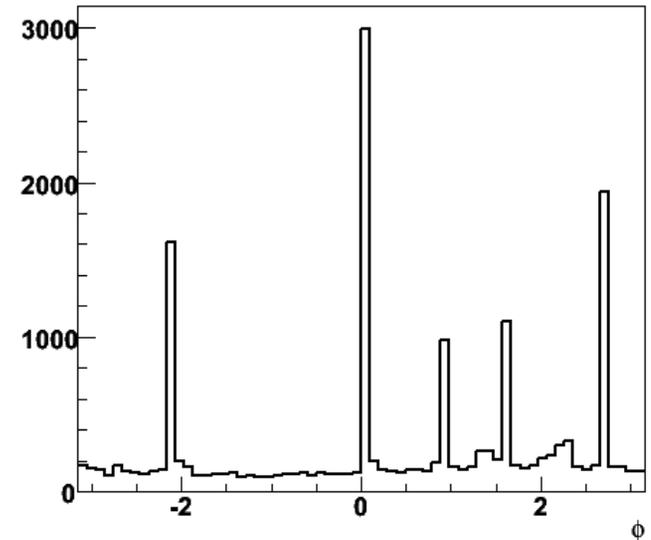
Run 91890, 1/physics_L1CaloEM
/CaloMonitoring/EMTopoCluster430/Occupancy/m_clus_phi0

Phi Energy > 0.0 GeV Apr 09 CaloTopo



Run 91890, 4/physics_L1CaloEM
/CaloMonitoring/CaloCalTopoCluster/Occupancy/m_clus_phi0

Phi Energy > 0.0 GeV Apr 09 EMTopo



Run 91890, 4/physics_L1CaloEM
/CaloMonitoring/EMTopoCluster430/Occupancy/m_clus_phi0

Clearly More work needed to find and mask noisy/hot cells

Cluster Plots easy choice for DQ for pinpointing Problems

Next steps

- Complete robust basic DQ logic, test on run 91639, then extend to more runs
 - **Correlate** Data Integrity ↔ Digits ↔ LArRAwChannels ↔ CaloCells
 - ▶ Use offline web display like in http://earwulf.web.cern.ch/earwulf/atlasdqm/5000/NoStream/run_91890/run/index.ht
 - **Correlate** CaloCells ↔ Calo TopoClusters/Towers ↔ Jets
 - ▶ Update <https://twiki.cern.ch/twiki/bin/view/Atlas/CaloCosmics08Repro>
 - add basic Trigger awareness
- Update DQMF offline results (where/if possible)

Next steps (cont)

- Test new DQ assessment using iterative process in June cosmics data running
 - Update online and offline configurations
- Update documentation (Twiki/TNote, LAr Manual, LAr DQ paper)

Operation aspects

- CaloMonitoring should be manned by LAr and Tile
- DQ results from CaloCells: checked by calorimeter shifters (online and offline)
- DQ results from CaloClusters and Towers + some CaloCells (CaloGlobal):
 - possibly checked at both calorimeter desks and by Jet shifter?
 - OTP?