

ITS Quality Assurance (& DQM)

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Summary

- ITS Offline QA
 - ⇒ Approach
 - ⇒ Status
 - ⇒ Plans
- ITS QA code for the Online DQM
 - ⇒ Status
- What's Next...



Offline QA

- Approach

- ⇒ Minimize code duplication (SDD & SSD)
 - ✓ *Code for QA & DQM in AliRoot*
 - ✓ *amoreAgent to drive the DQM, which calls AliRoot*
 - ✓ *DQM GUI in Amore*

- ⇒ Online Monitoring

- ✓ *Used during the last cosmic run*

- ⇒ Build QA distributions on real Data



SPD QA

- Implementation status

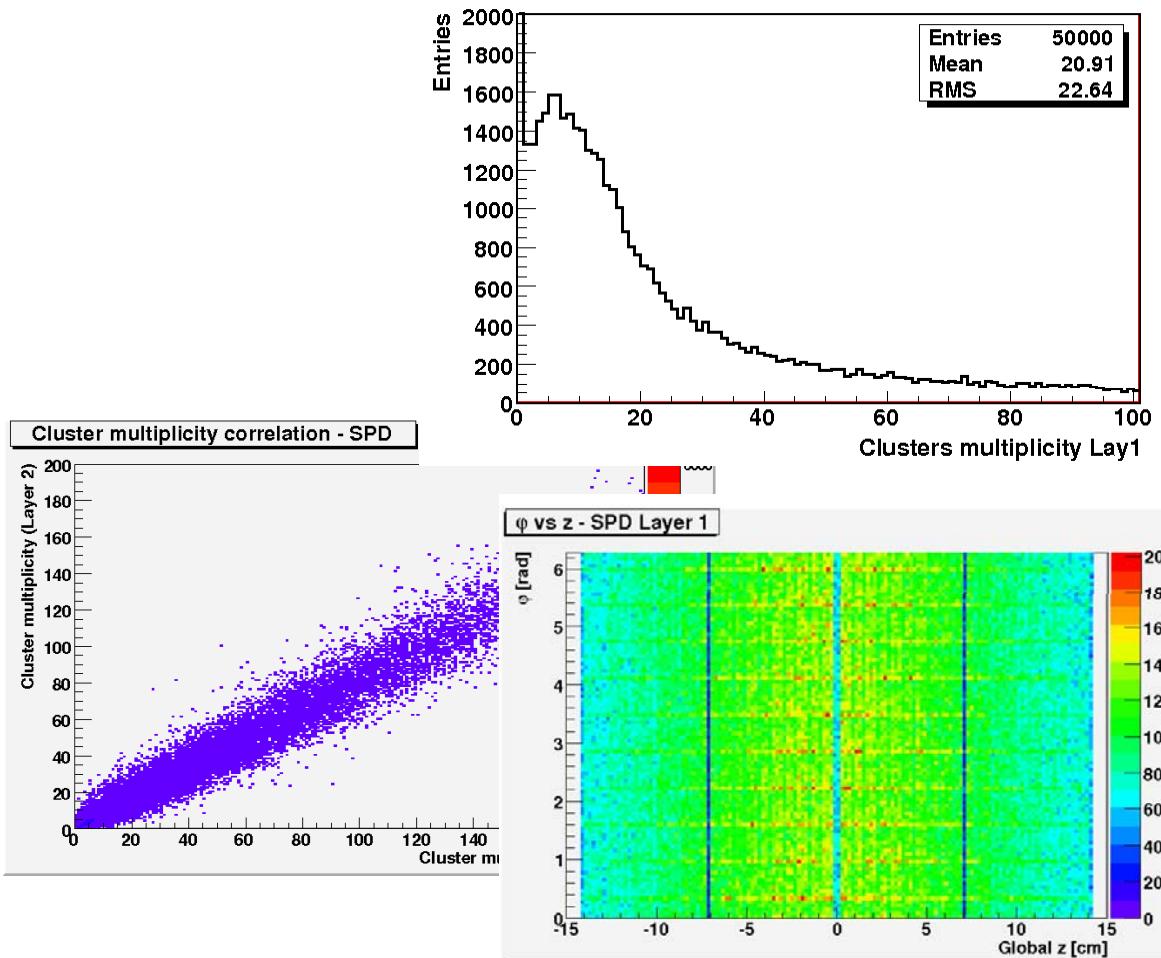


SOURCE	Definition of monitored objects	Code implementation	Code in SVN	Warnings	Comparison with ref. data
Online - RAW					
Online - RecP					
Offline - RAW					
Offline - RecPoints					
Offline - ESD					
Offline - Digits					



SPD QA

- Implementation status



- Cluster map - 1 bin/Layer, so 2 bins
- Cluster map in Layer 1 (SPD1), 1 bin/module
- Cluster map in Layer 2 (SPD2), 1 bin/module
- Cluster multiplicity distribution in Layer 1 (SPD1)
- Cluster multiplicity distribution in Layer 2 (SPD2)
- Cluster multiplicity distribution, Layer1 vs Layer2
- Layer 1 (SPD1) - cluster size (Ylength vs Zlength)
- Layer 2 (SPD2) - cluster size (Ylength vs Zlength)
- Layer 1 (SPD1) - cluster radius
- Layer 2 (SPD2) - cluster radius
- Layer 1 (SPD1) - cluster ϕ
- Layer 2 (SPD2) - cluster ϕ
- Cluster radius vs ϕ
- Cluster z vs ϕ
- Cluster x vs y
- Layer 1 (SPD1) - cluster **local** coordinates x , y
- Layer 2 (SPD2) - cluster **local** coordinates x , y
- Layer 1 (SPD1) - cluster coordinates x , y , z
- Layer 2 (SPD2) - cluster coordinates x , y , z



SSD QA

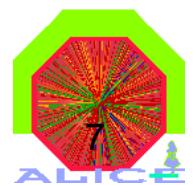
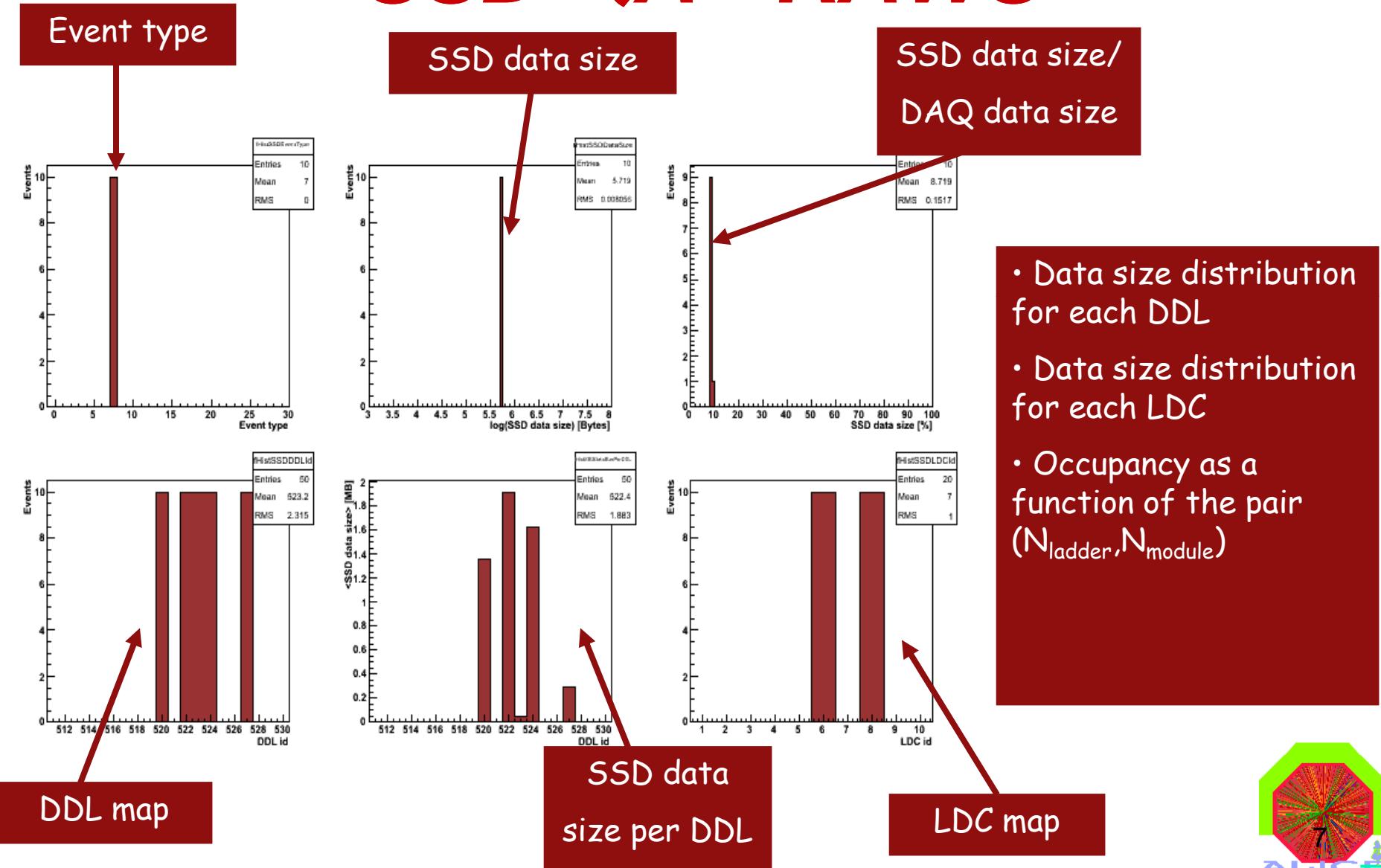
- Implementation status



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Offline - Digits					



SSD QA - RAWS



SSD QA - CLUSTERS

- Module ID map:
 - ⇒ Modules that have a cluster
- Distribution of local x and z coordinates
- Distribution of the global x, y, z coordinates
- Distribution of the θ, φ, r coordinates
- Cluster type distributions
- Charge ratio = $(qp - qn)/(qp + qn)$
- Charge [KeV]
- Charge map [KeV] = $f(N_{\text{module}}, N_{\text{ladder}})$



SDD QA

- Implementation status



SOURCE	Definition of monitored objects	Code implementation	Code in SVN	Warnings	Comparison with ref. data
Online - RAW	READY	READY	READY	NOT STARTED	NOT STARTED
Online - RecP	READY	READY	READY	NOT STARTED	NOT STARTED
Offline - RAW	READY	READY	READY	NOT STARTED	NOT STARTED
Offline - RecPoints	READY	READY	READY	NOT STARTED	NOT STARTED
Offline - ESD	READY	NOT STARTED	NOT STARTED	NOT STARTED	NOT STARTED
Offline - Digits	READY	NOT STARTED	NOT STARTED	NOT STARTED	NOT STARTED



SDD QA/DQM

- SDD Control List

⇒ *Digit (module, anode, time, charge) Level - Detector Performance*

- Baselines (-> dead channels)
- Noise
- Injectors
- Layer 1/Layer 2 entries

✓ *Layer Level*

- N_entries vs Ladder Number

✓ *Ladder Level*

- N_entries vs Detector Number

✓ *Detector Level*

- Patterns (N_entries vs. Anode, Time Bin)
- Q_Average vs Anode
- Q_Average vs Time
- ...



SDD QA/DQM

- SDD Control List

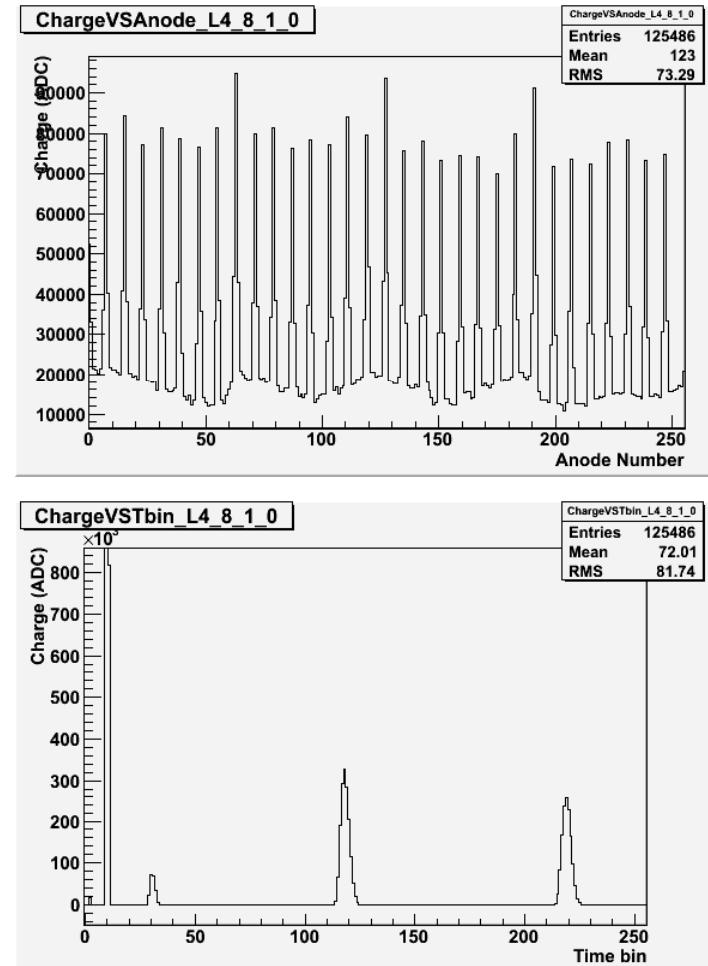
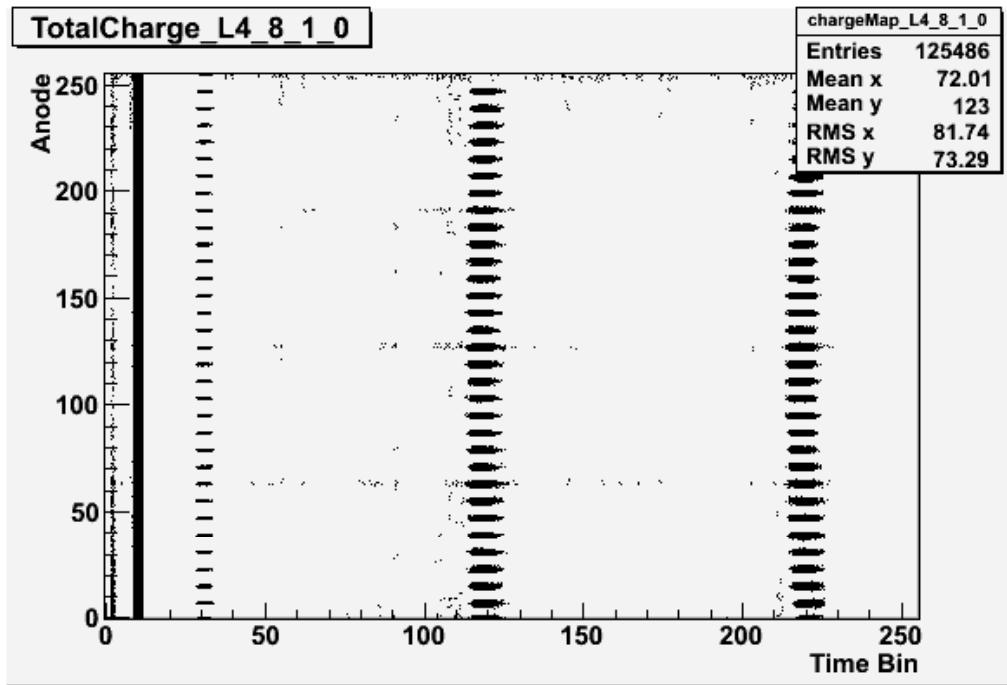
⇒ *RecPoint/Cluster (module, X, Y) Level - Reconstruction Validation
(...not for ONLINE...)*

- Layer 1/Layer 2 entries
- ✓ *Layer Level*
 - N_entries vs Ladder Number
- ✓ *Ladder Level*
 - N_entries vs Detector Number
- ✓ *Detector Level*
 - Patterns (N_entries vs. X, Y)
 - Q_Average vs X
 - Q_Average vs Y
 - ...



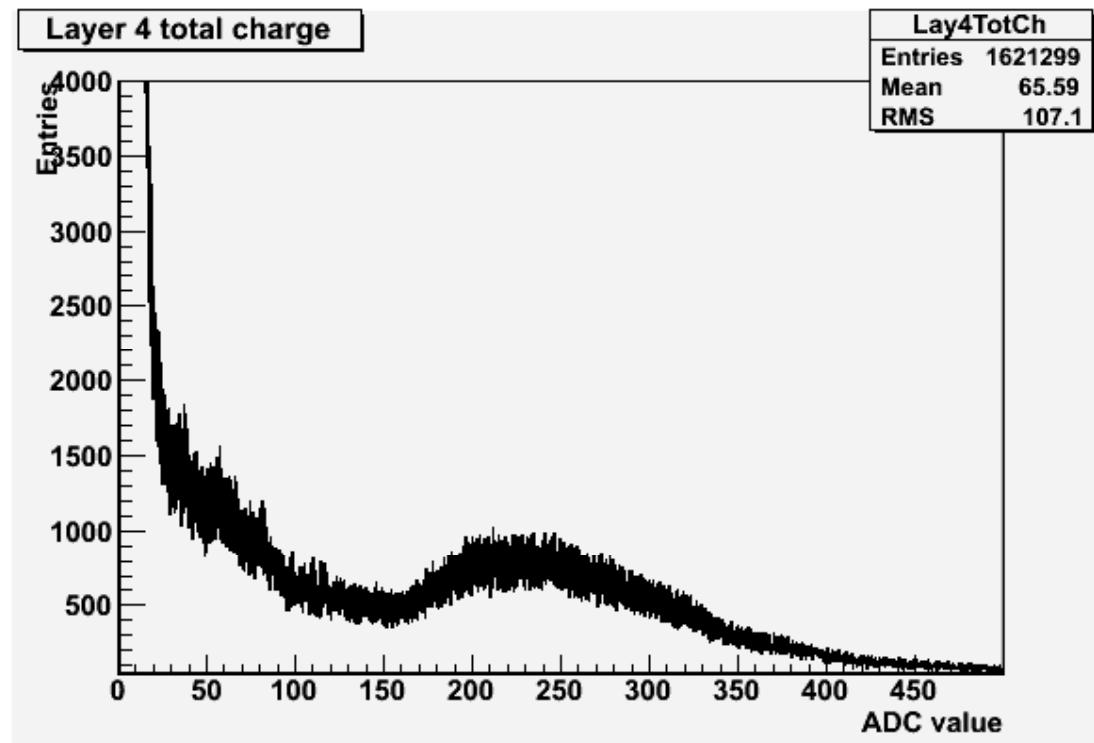
SDD QA/DQM

- Module map for injector run



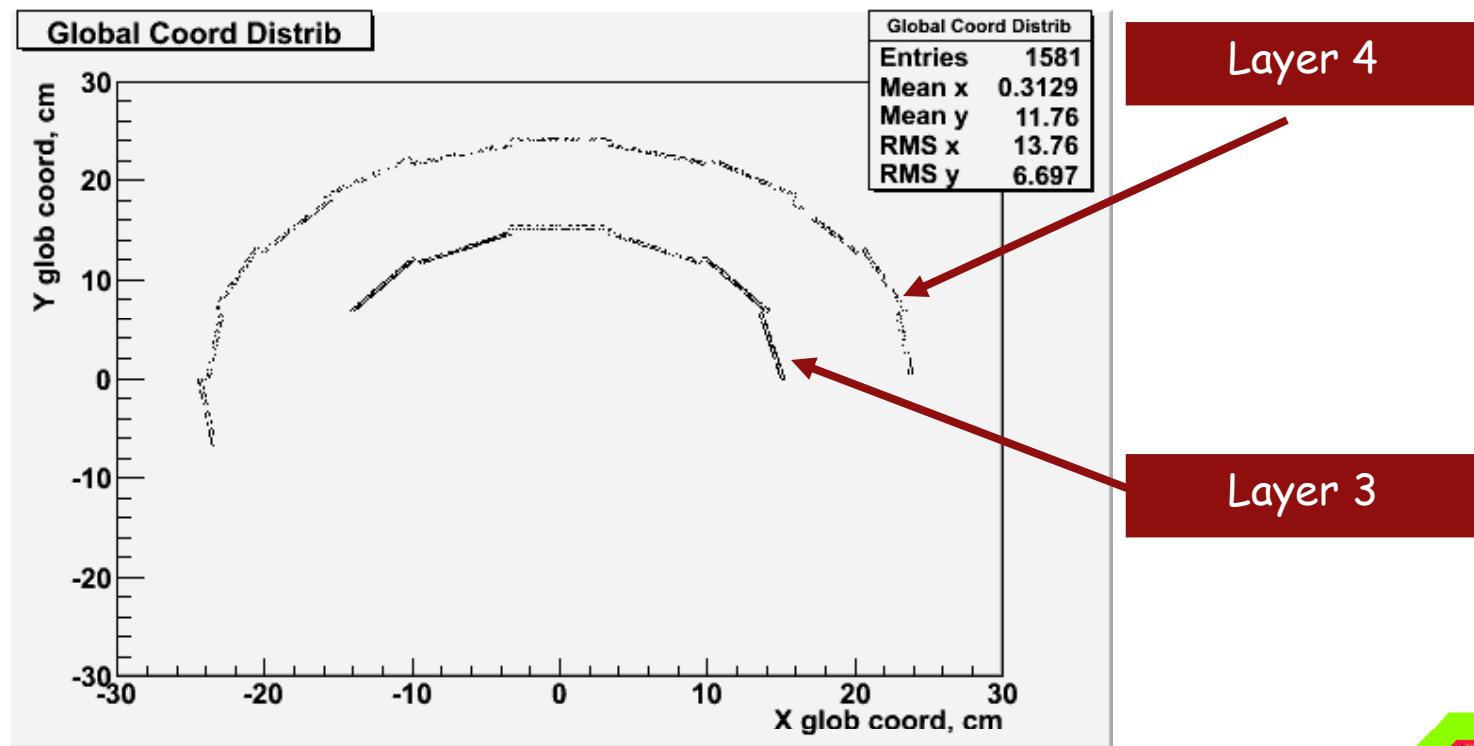
SDD QA/DQM

- Cluster charge



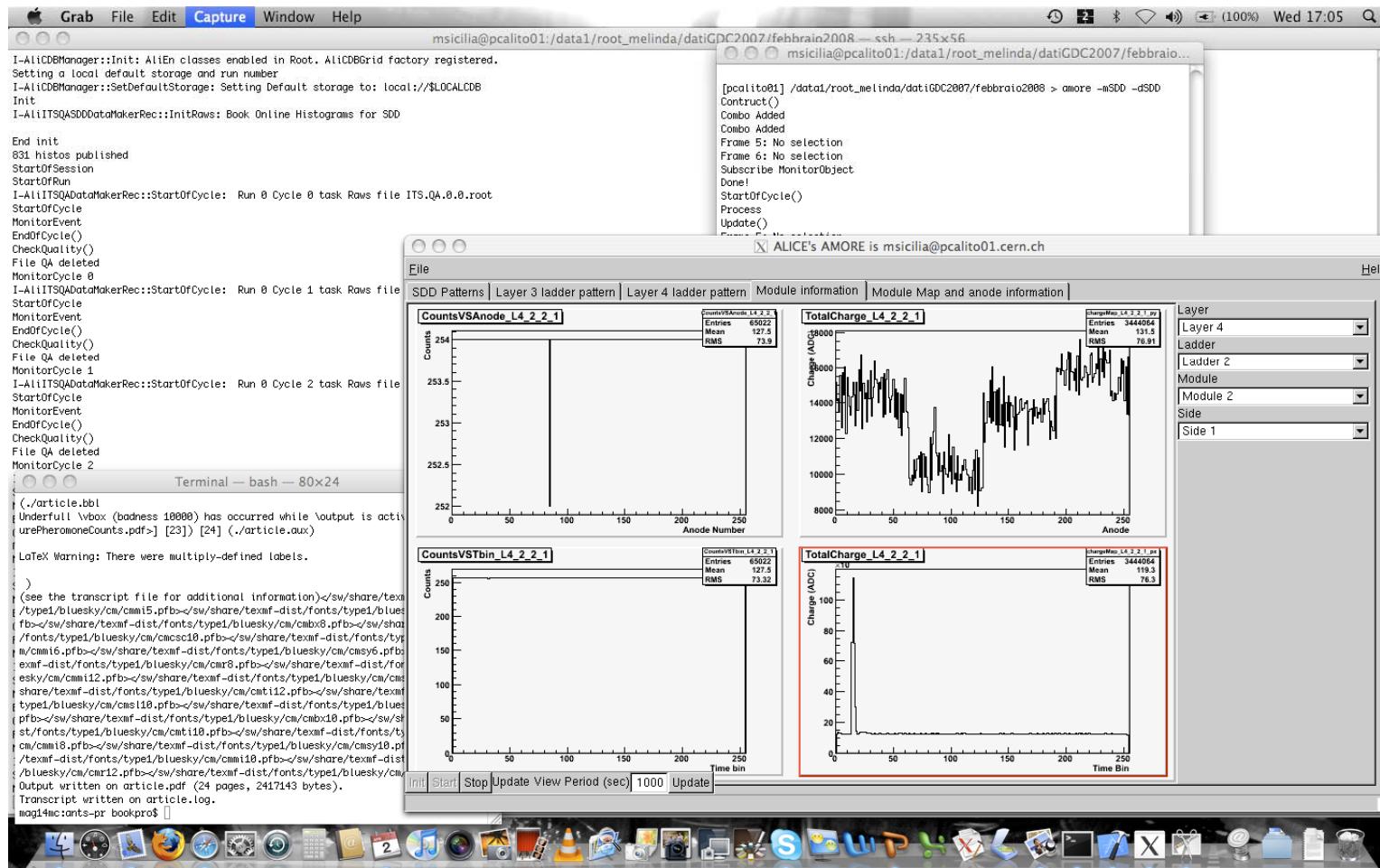
SDD QA/DQM

- Cluster Global coordinates



SDD DQM

- SDD Amore/DQM GUI



What's Next?

- ONLINE DQM/QA

⇒ SPD

- ✓ Until now, stay with MOOD

⇒ SDD/SSD

- ✓ AMORE + AliRoot

- ✓ Improve the GUI

- ✓ Optimize the updating frequency (-> speed)

- ✓ Add long-term detector controls (SDDs)

- Drift speed vs time

- Baseline vs time

- ...

- ✓ Minimize the number of histograms...

- ✓ Exploit the improvements in the new AMORE version

- Custom time interval for update

- New Subscribe procedure

⇒ AMORE improvements wishlist

- ✓ Update histograms dynamically ONLY when they are requested from a GUI agent
(minimize task load...)



What's Next?

- OFFLINE QA

⇒ SPD/SDD/SSD

- ✓ *Improve the DataMaker implementation*
- ✓ *QA Checker implementation*

- Define the reference distributions
 - This is the difficult part
 - The detector behaviour is not understood (yet)
 - It can be implemented on simulated data, but it is meaningless (you get what you put...)
 - Reference distributions should be blessed by the hardware people
- Implement the QA set of checks and provide the QA result
 - Who does the SPD/SDD/SSD merging?

