

EMC shower reconstruction in pandaroot

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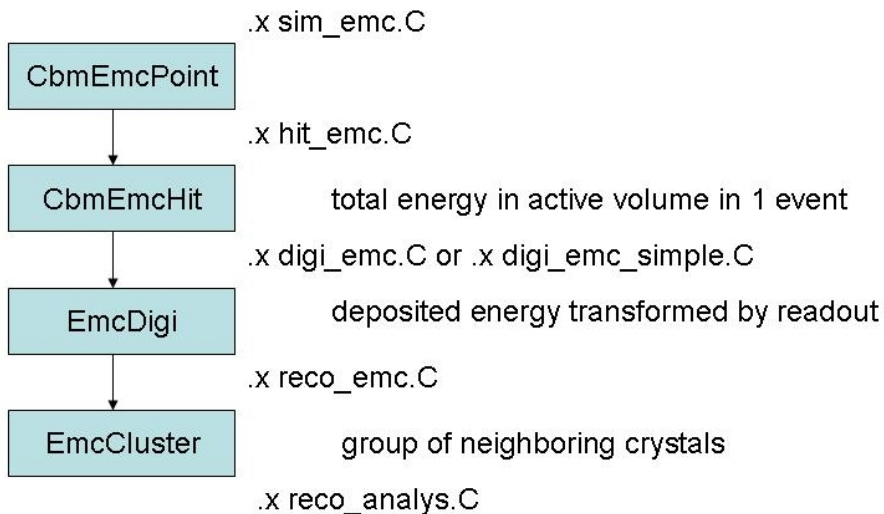
PANDA colaboration meeting, 26.03.2007

General remarks

- Cluster reconstruction algorithm in pandaroot is an adaptation of the algorithm implemented by Jan Zhong in Babar framework for PANDA EMC.
- Only one method to determine cluster position is implemented - Lilo (linear+logarithmic weighting) from the several existing in Babar framework.
- Results presented here are obtained with Geant 3, since at the moment Geant 4 simulation in pandaroot is very time consuming (factor 20 in comparison with Geant 3).
- Calibration is implemented separately for "simple" and "full" digitization and not suitable for Geant 4 simulation which produce slightly different results.
- Reconstruction code at the moment works only with Barrel EMC

Structure of EMC code

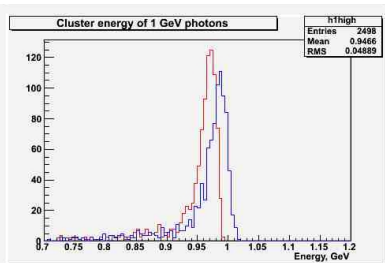
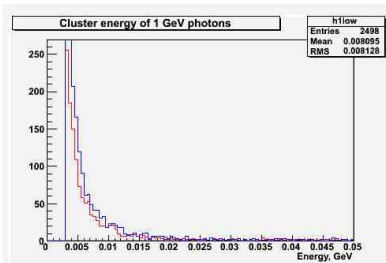
Full simulation-reconstruction chain at the moment:



Digitization

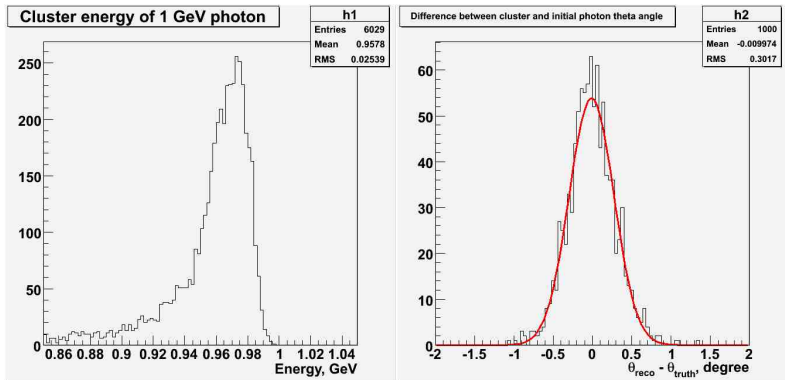
Parameter used in digitization

- Photon statistics - 80 p.e. per MeV
- Electronic noise - 1 MeV
- Digital resolution - 16 bit
- FADC frequency - 80 MHz

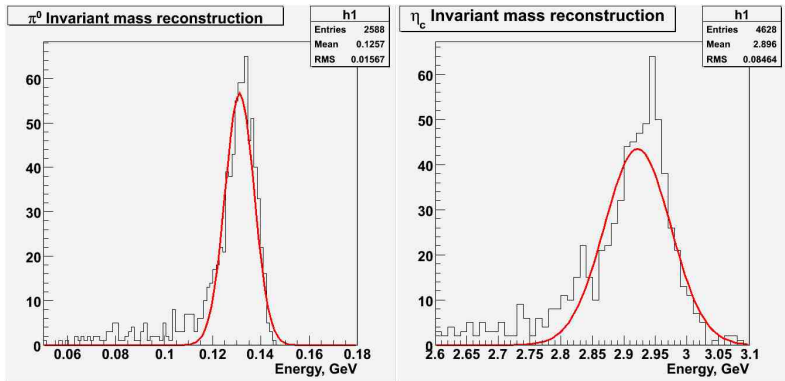


Energy and position resolution

- 5000 photons simulated with 1 GeV energy
- θ range [60-120 degree], ϕ range [0-360 degree]
- 3 MeV threshold for single crystal



Invariant mass reconstruction



Summary

Outlook and plans

- Implementation of calibration to take into account shower leakage is in progress
- Source of inconsistency between Geant 3 and Geant 4 should be determined
- Finish reconstruction for endcaps.
- Implement Bump slitting (the case when cluster created by 2 particles and has 2 local maximum of energy).