EMC projectivity correction

EMC software workshop
December 2004
Introduction

- In “surface” position method, digi position is assumed to be in centre of front-face of crystal
  - Slight shift in ϑ

- With “depth” method, digi position is 12.5cm back into crystal
  - Shift is much smaller, but not negligible
Correction function

- Correction function applied in EmcCalibToo/EmcMkIIMCCalibrator
  - Used when making EmcCands from EmcBumps

\[ \Delta \theta = P1 \times (1 - \exp(P2 \times \cos(\theta))) / (1 + \exp(P2 \times \cos(\theta))) \]

New parameters:

- \( P1 = -0.000867 \)
- \( P2 = -12.05 \)
Cross-checks

- Data: use mumugamma sample – can obtain theta from 1C fit to muon tracks
- Single pi0 MC - compare pi0 peak with depth/surface methods, old/new correction constants
Loading the constants

- Projectivity correction constants are stored in EmcMkIIComboCalibratorP object
  - Also stores cluster energy calibration constants
  - Needed to load new objects for each validity period, keeping energy constants the same but changing position coefficients
- Used application storeEmcCalibrators in EmcCalibToo package
  - Runs with command storeEmcCalibrators [list_of_dat_files]
  - dat files used are at:
    /nfs/farm/emc/new_global_calib/EmcComboPi0MCCalibrator01Jan00_[1-12].dat
  - If anyone loads new cluster energy constants, please make sure dat file has correct position coefficients (don’t use the *.surfaceMethod files in this dir..)
- Loaded into MASTER database in October
  - Followed instructions at
  - Since then, they have been swept into test15boot and cond16boot
    - Can check with commands
      - CdbBrowser objects /emc/EmcMkIIComboCalibratorP
      - Oodump –id [object id]