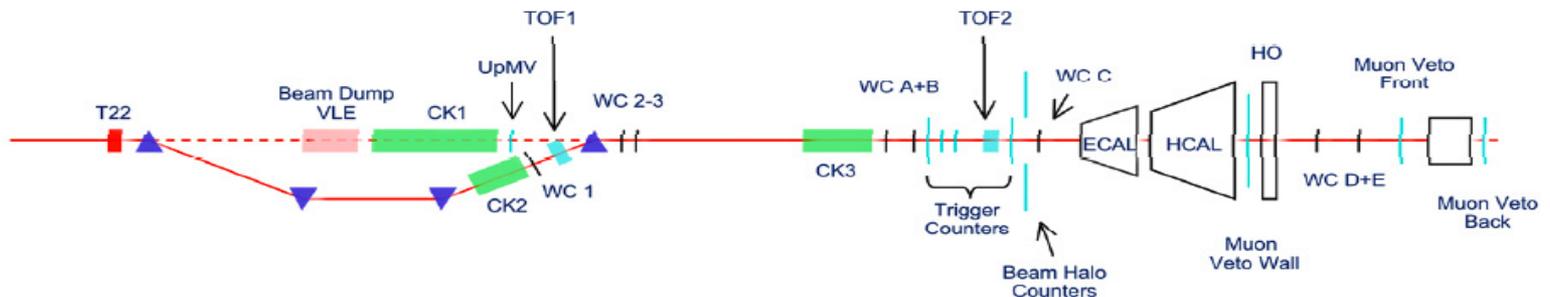


H2 ECAL Analysis



Andrew Askew
Florida State University



$e\gamma$

H2 Test Beam



- Combined HCAL/ECAL test.
- Data:
 - Local calibration scan 50 GeV e^+ wide beam.
 - Low energy scans (π^+ , π^- , e^-) at 1-9 GeV.
 - π^+ , π^- at 20, 30, 50, 100, 150, 300 GeV.
 - e^+ at 20, 30, 50, 100, 150 GeV.
 - Muons (APD gain 200).
- This talk: Snapshot of current work using this data.



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Same as H4?



- Not quite:
 - H4 is in a temperature controlled (i.e. air conditioned) area. H2 is not: it sits in the open beamline wrapped in a big mylar sheet.
 - For intercalibration: Beam not small.
 - Issues with hitting beamline elements (shower starts early, energy loss)?
 - For low energy, energy lost in beamline elements?



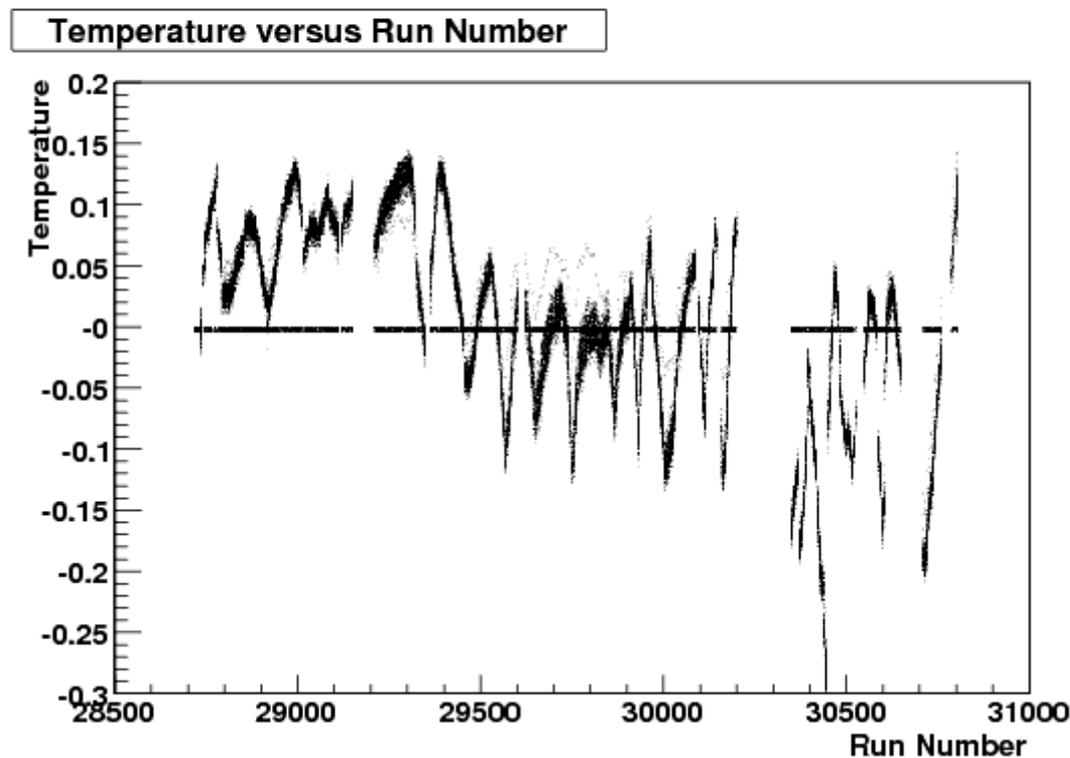
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Temperature Corrections:



- Temperature measurements for SM09 for the relevant run ranges.
- We will correct the response, for each tower, for each run.

A. DeBenedetti

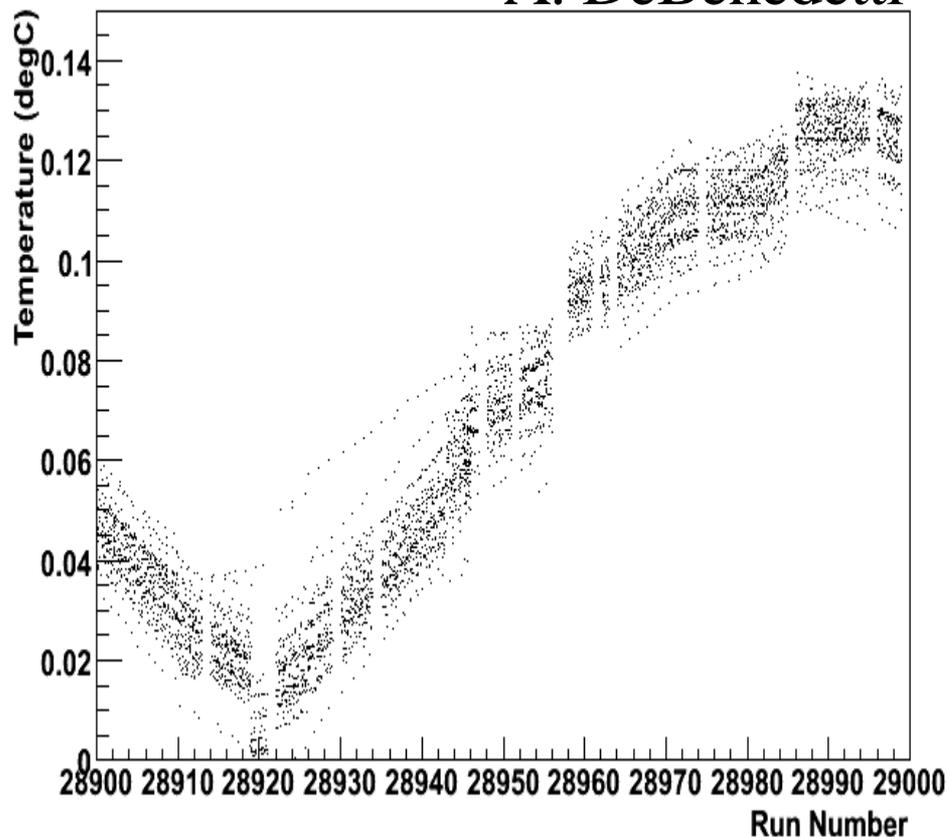


ey Note that:



- Even within a single run, the temperature tower to tower has some spread. Needs to be taken into account.

A. DeBenedetti

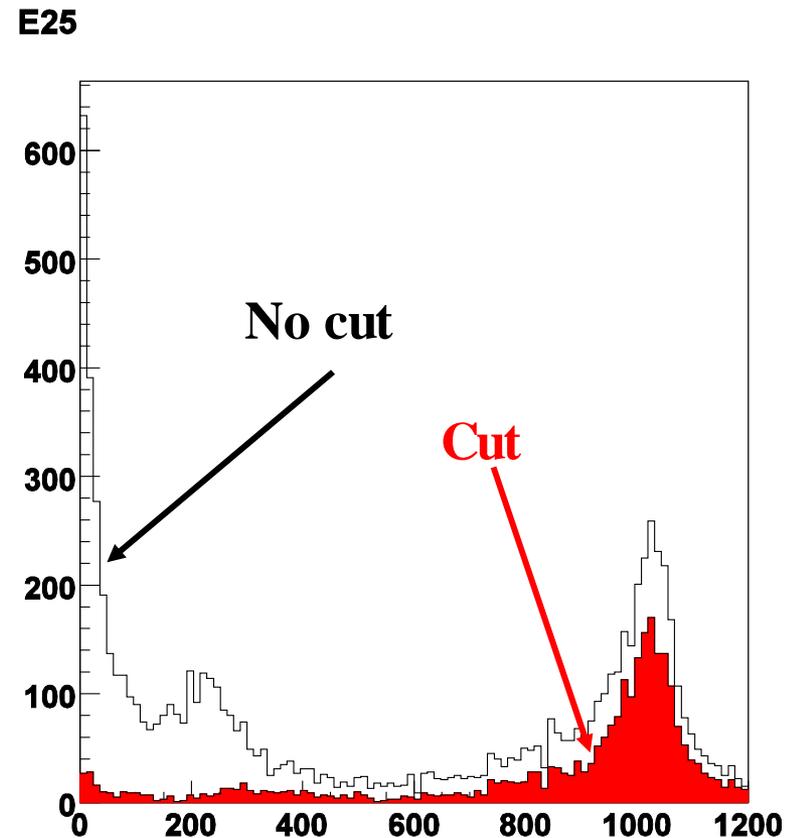


$e\gamma$ Beam Cleanup:



D. del Re

- Sample can be cleaned-up with a simple cut on WC hit position
- Several options. At the moment apply a simple cut on the measured X position difference between WC_A and WC_B
- $(-3 < X(WC)_A - X(WC)_B < 4.5)$
- It works, much better can be done with future studies.

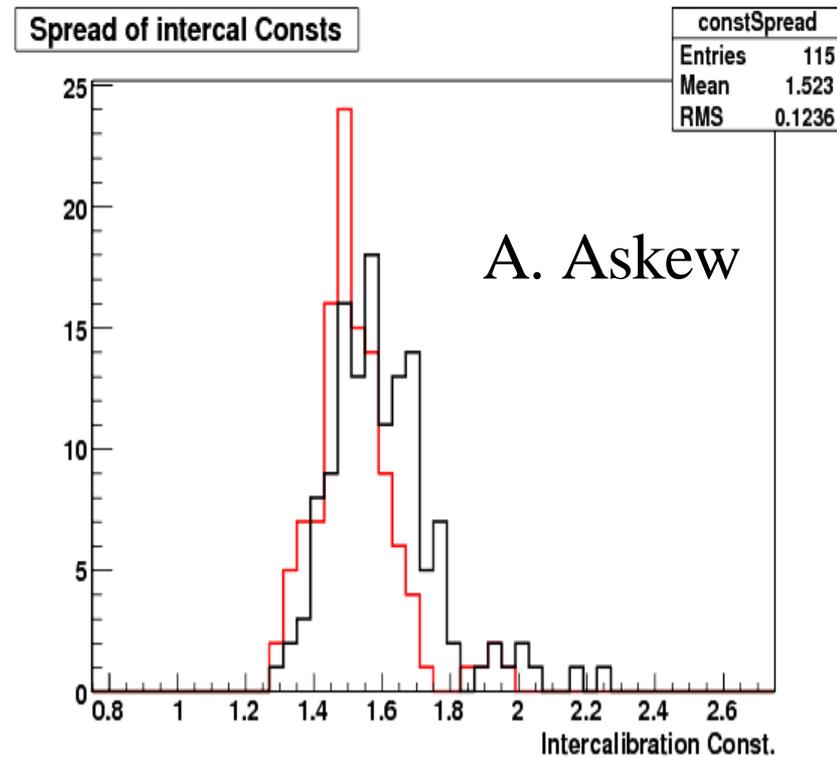
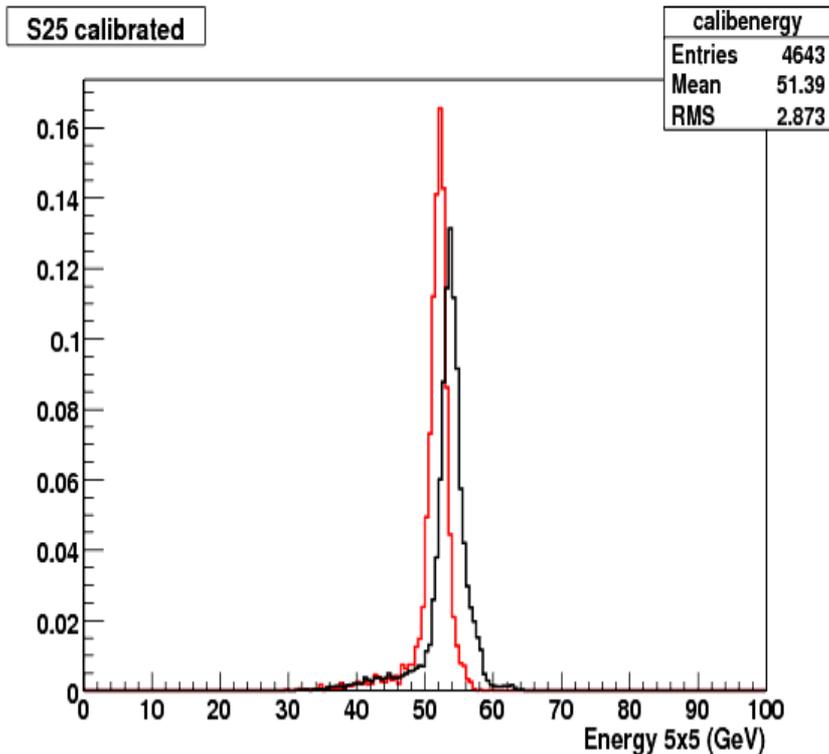


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Both Together:



- Using Abe's Temperature corrections and Daniele's beam cuts, re-create the S25 intercalibration coefficients:



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VLE Challenges



- Better define combined response of calorimeter by examining low energy data.
 - Knowing the beam energy becomes a non-trivial matter.
 - The amount of material in front of the combined ECAL/HCAL becomes relevant.

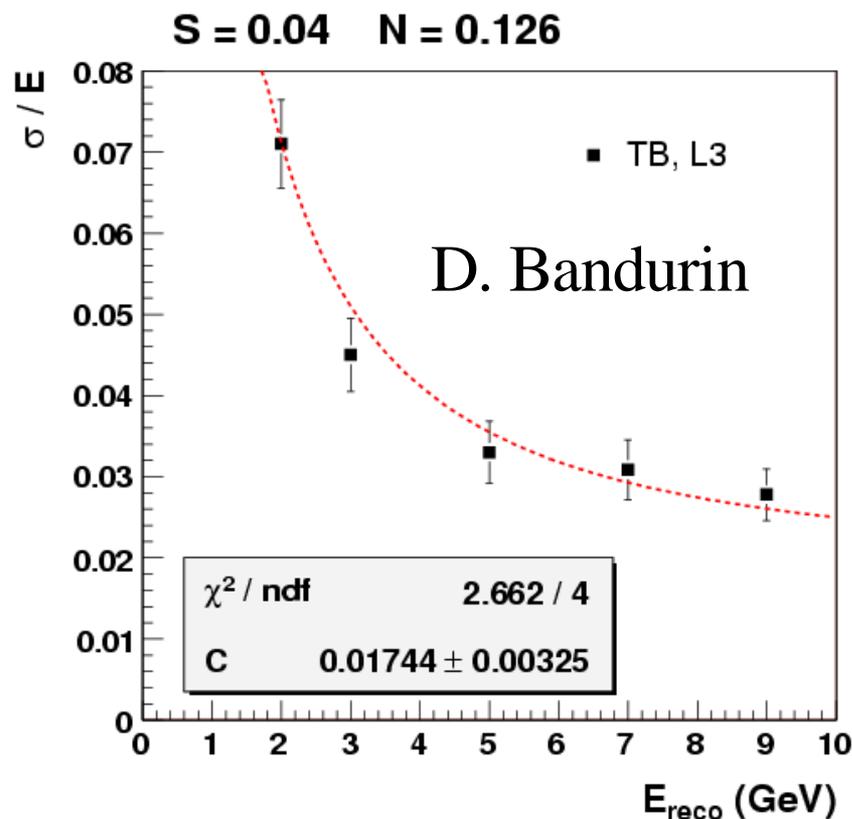


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Low Energy Resolution:



- Larger constant term than expected:
 - No temperature corrections, no intercalibration with those corrections.
 - What else is there?



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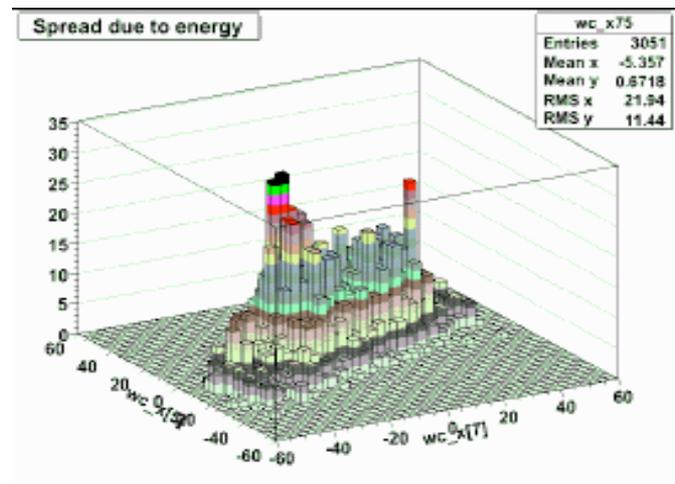
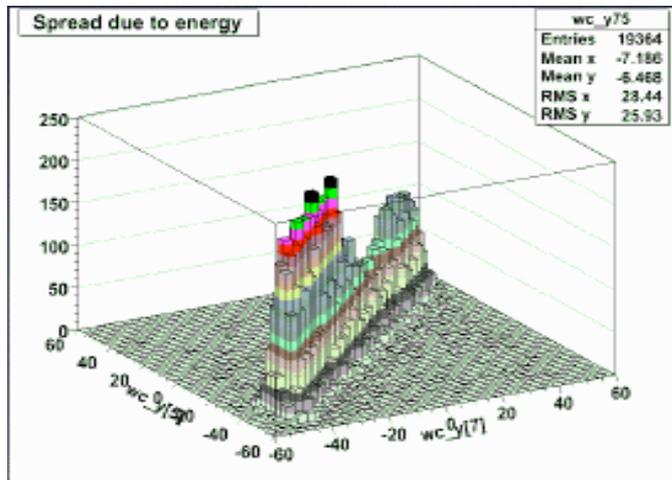
Low energy spread?



- We have observed thus far that the resolution at low energy differs by a few percent from the 'nominal'.
- We already have effects to correct for, intercalibration, temperature spread, but at low energy we compound things.



Correlation *ey* (before and after dipole)



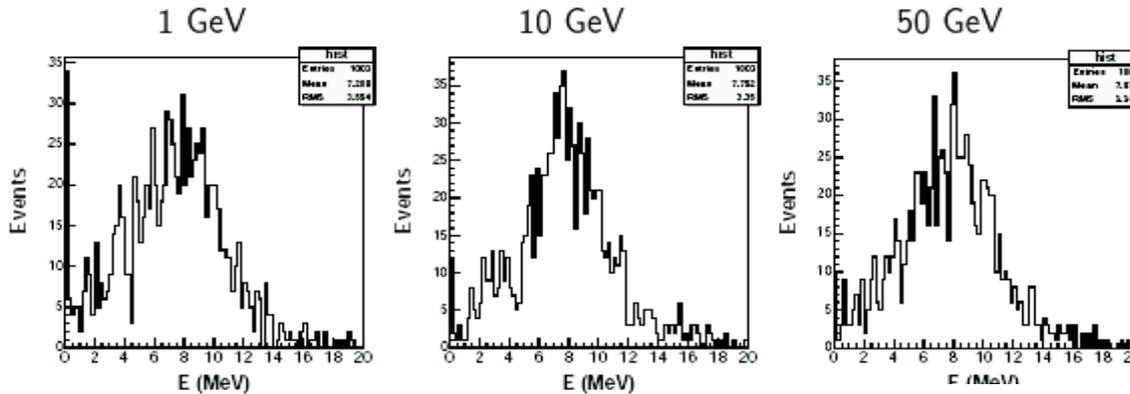
O. Atramentov

- Left: No bend due to field.
- Right: Expected bend if momentum spread.
- Efforts to correct for this underway.



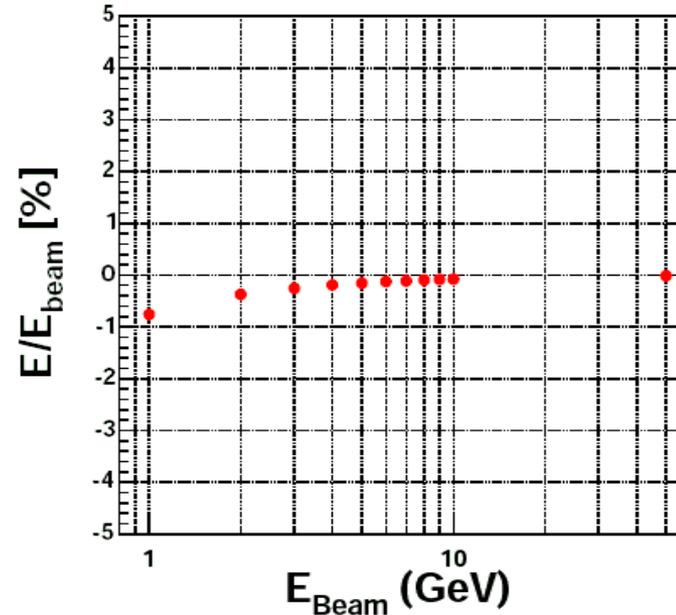
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Energy Loss in Beamline?



J. Zhang

- Appeal to MC, put in proper thickness of scintillators.
- Noticeable effect for VLE runs.



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More to come:

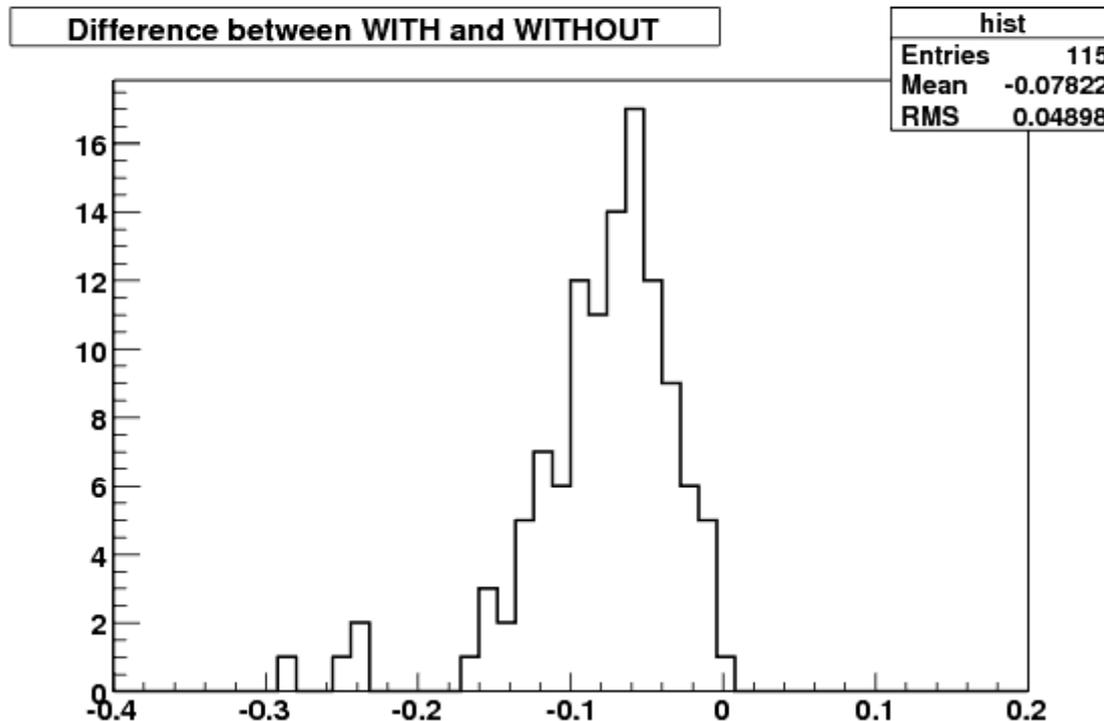


- Finish SM09 intercalibration:
 - Need Laser corrections, which tacitly include part of the temperature corrections.
 - Need to compare S25 constants with L3/S1.
- With the intercalibration in hand:
 - Study response of combined HCAL/ECAL from very small energies to much higher ones.
 - Exploit dipole position to limit errors due to beam energy?



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Crystal By Crystal Difference



About 5% mean shift in intercalibration consts.



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H2 Beamline:



H2 Beam Line

