

Crystal Update

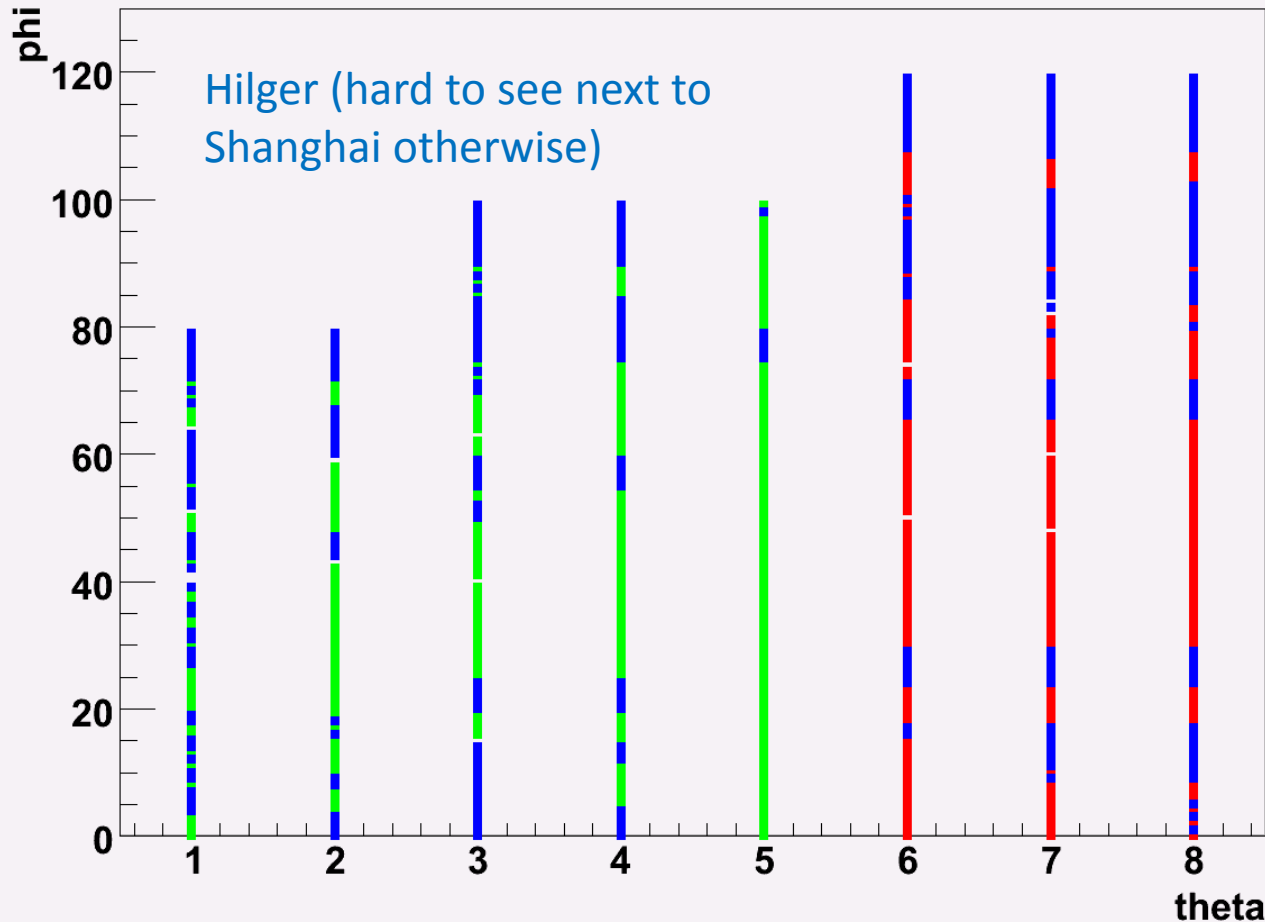
David Doll

Outline

- Distribution Overview
- Normalization Procedure
- Compare to previous study
 - LY falloff by section/manufacturer
- Theta Ring comparisons (profile plots)
- Increase vs. Decrease comparison

Distribution Overview - Endcap

phi:theta {date<500 && theta<9}



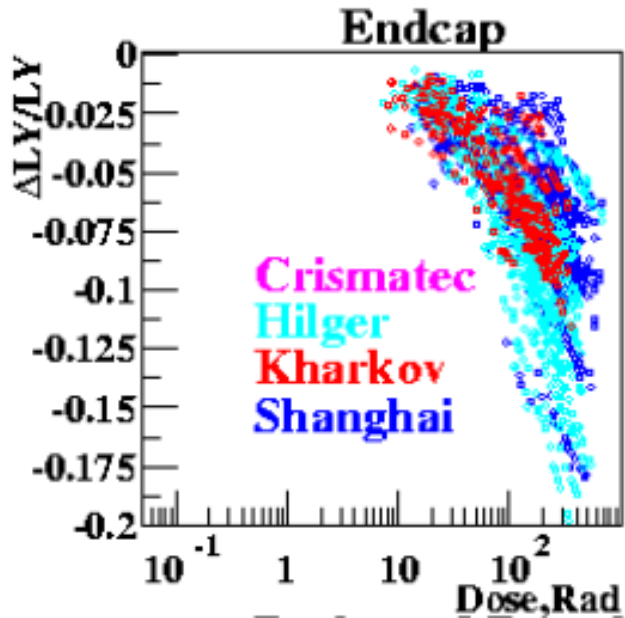
Only 3
manufacturers

Normalization Procedure

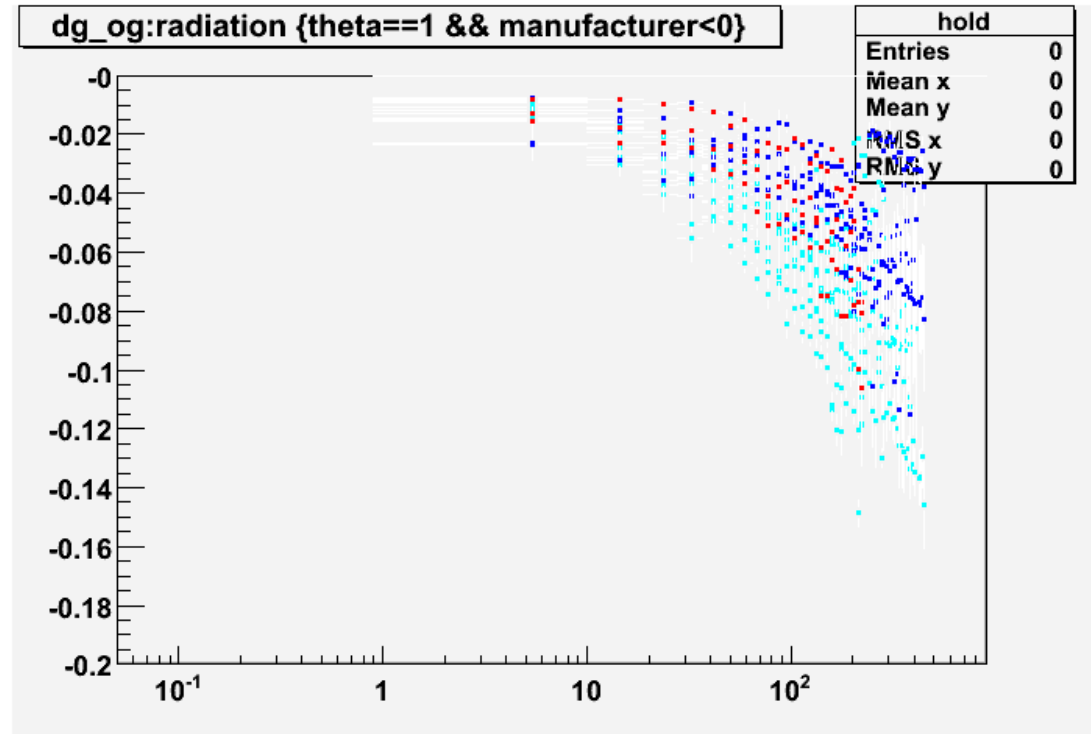
- Separate the crystals into 3 sets
 - Endcap (EC){theta 1-8}
 - Barrel Forward (BF){theta 9-35}
 - Barrel Backward (BB){theta 36-56}
- Go through each set and removed extremely noisy/dead crystals and days
- Normalize to earliest date that has reasonable gain

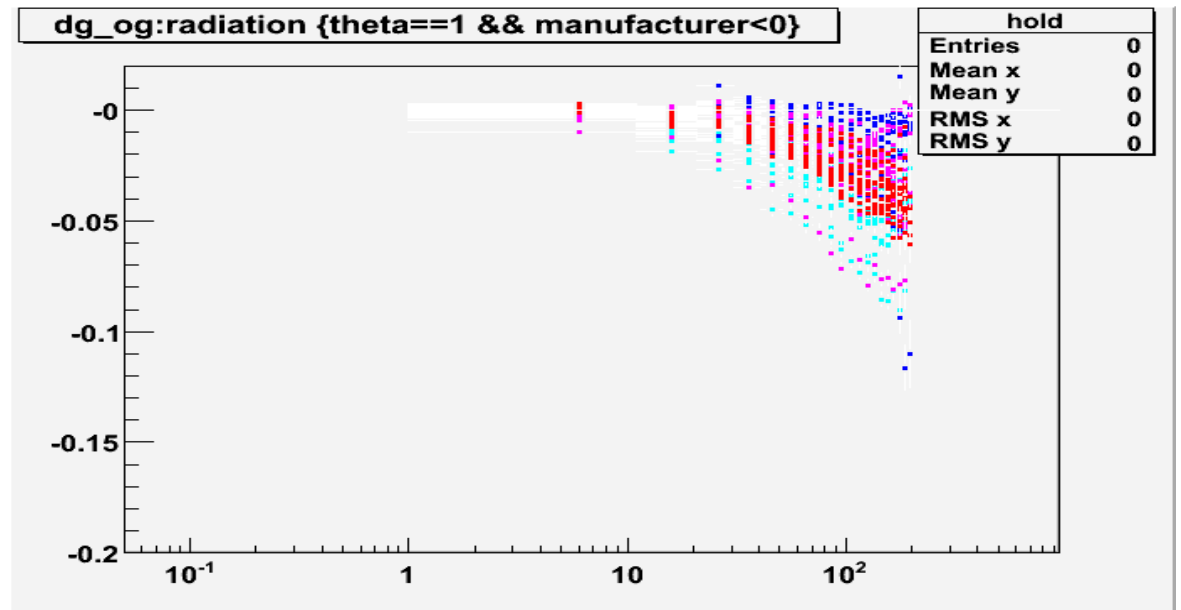
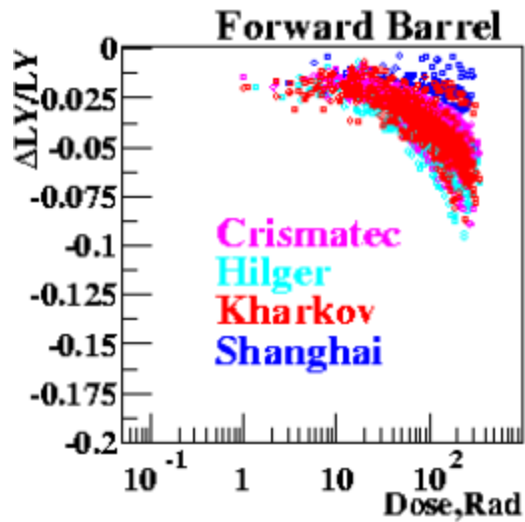
Comparison with Previous Study

Want to make sure we're at least looking at the same data

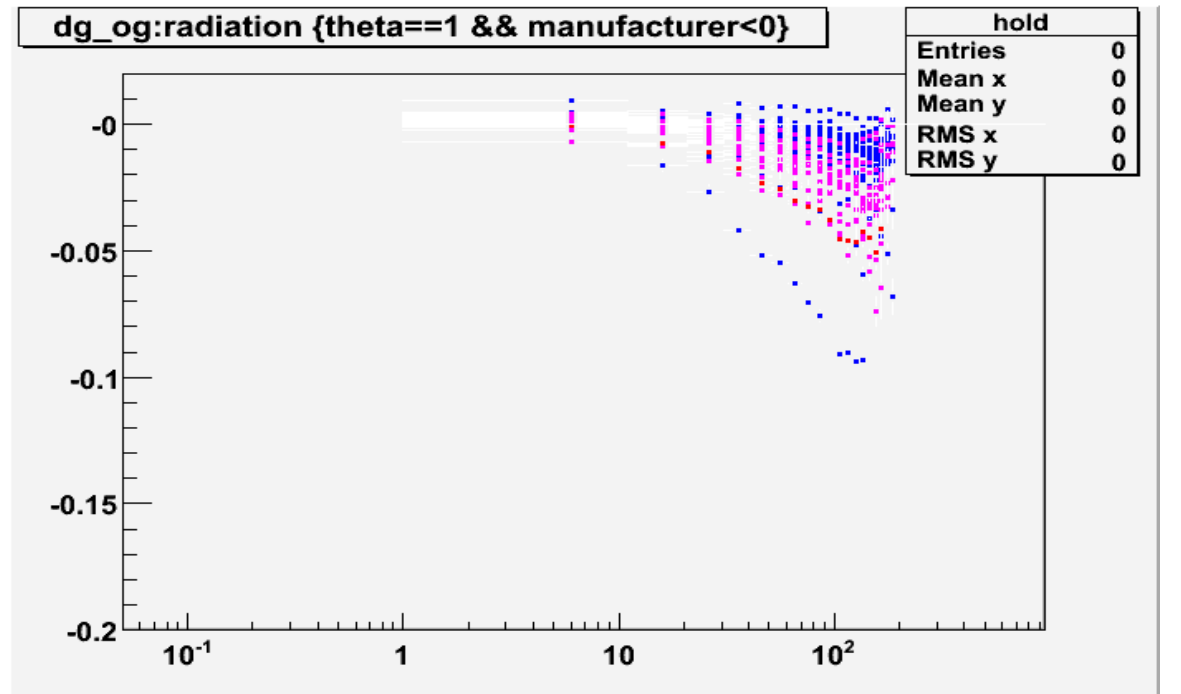
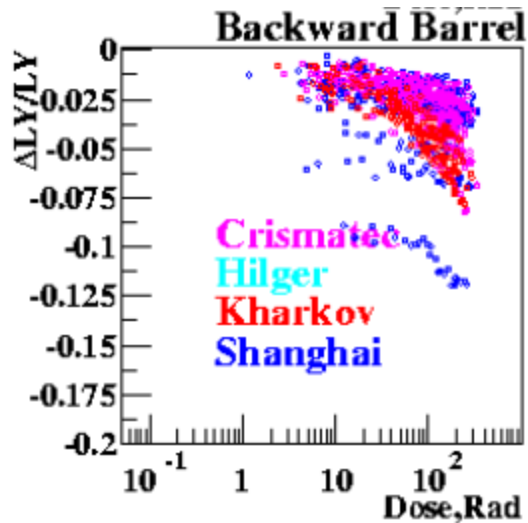


Previous study

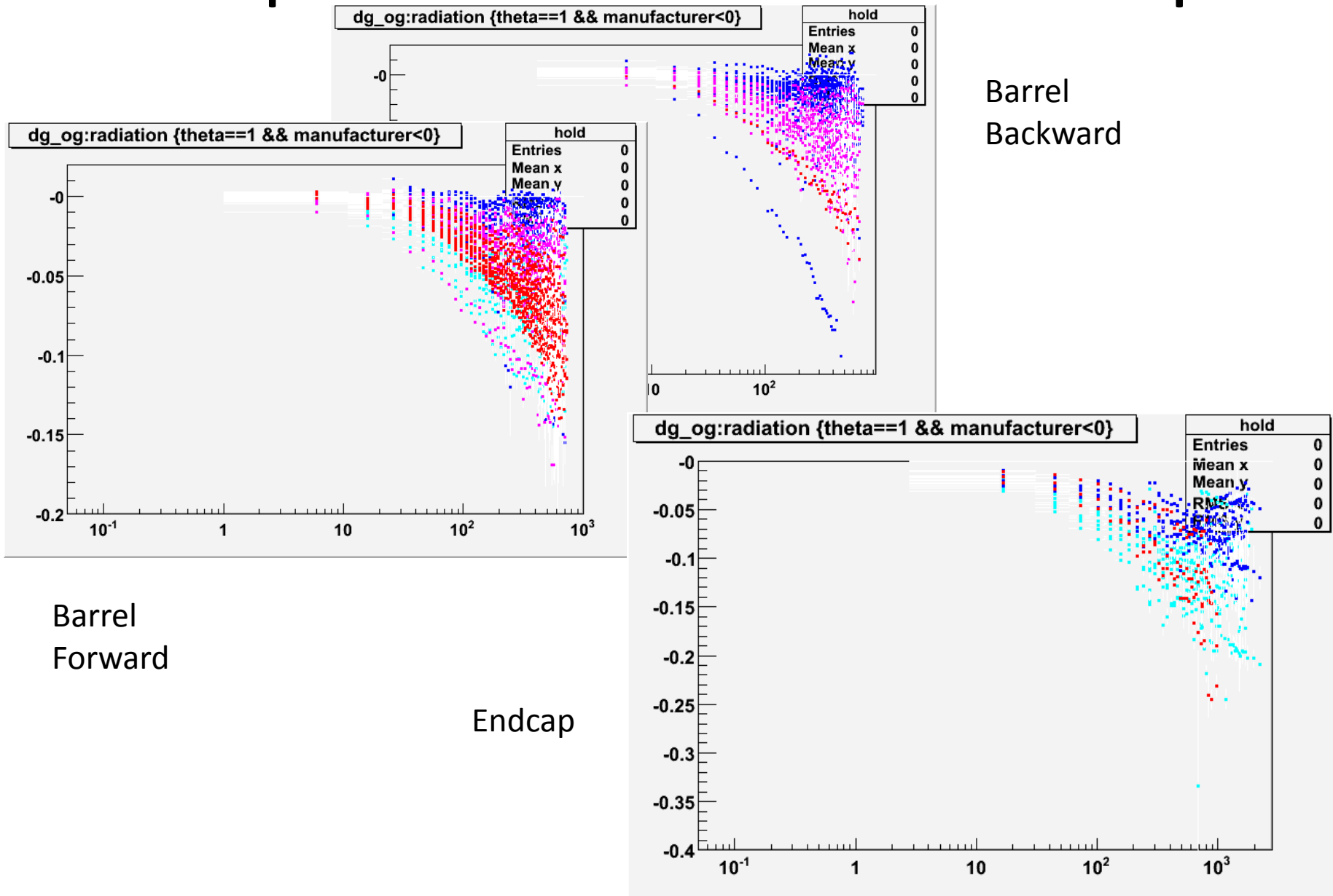




Previous study

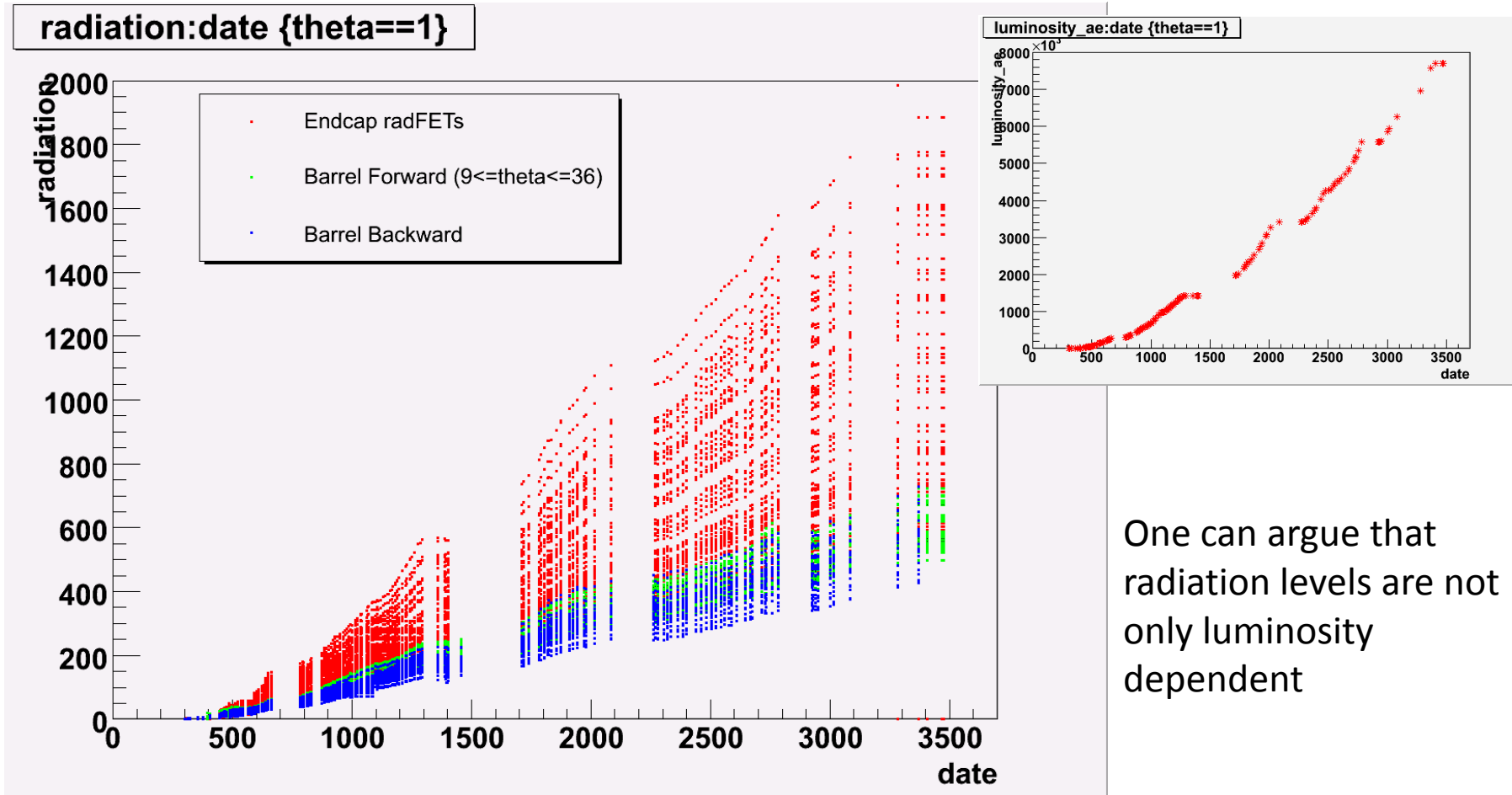


Same plots over whole run of exp.

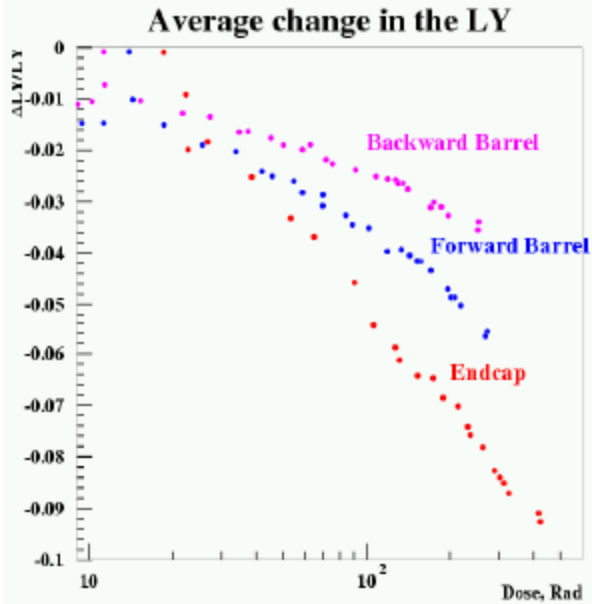


Radiation Levels by Section

- Just a reminder from Aidan's work

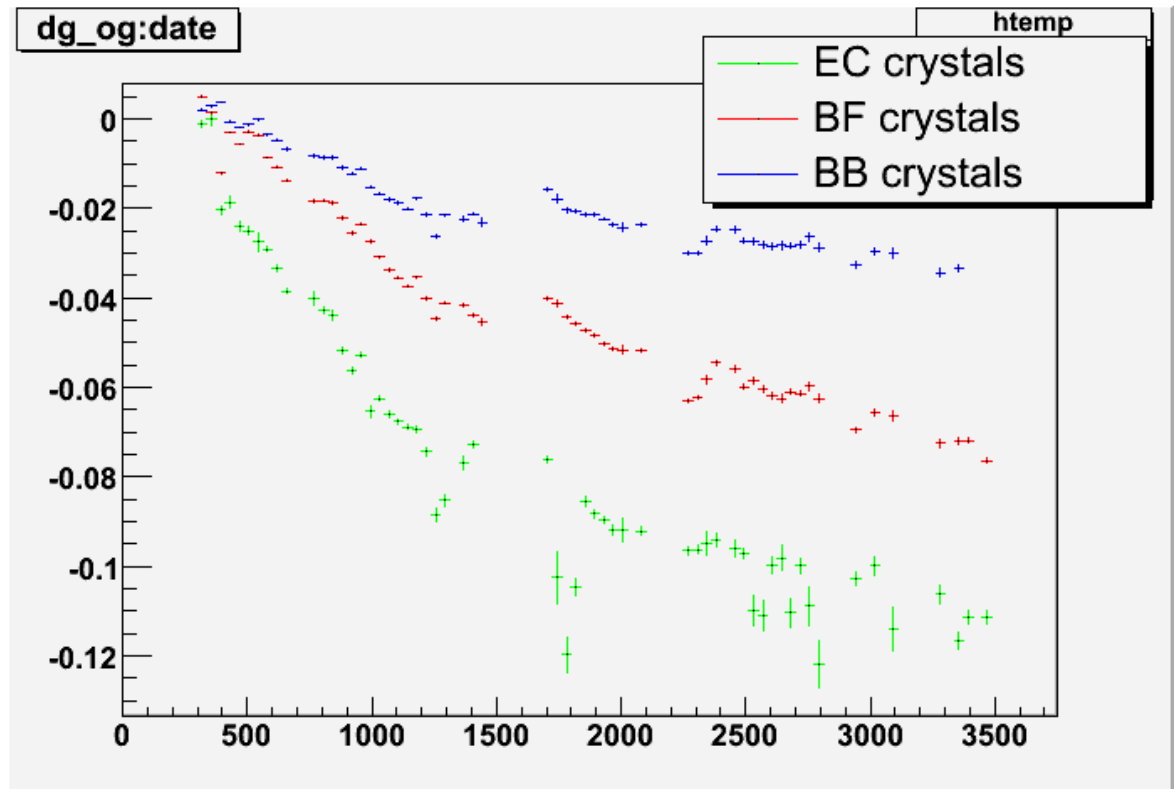


LY Falloff

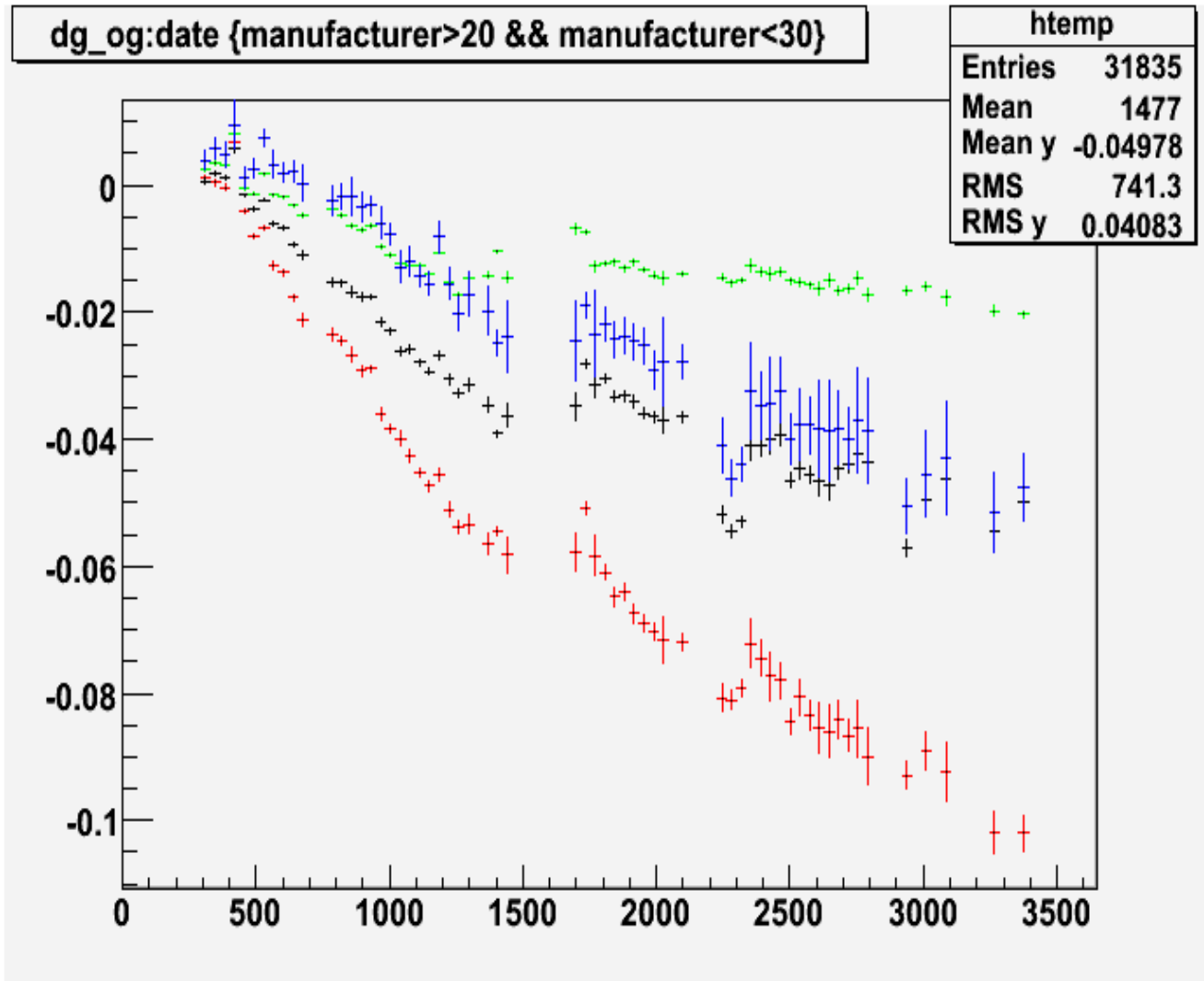


Previous study

I plotted mine wrt date, because I can't figure out how to get rid of the error bars in profile plots!! Behavior is the same however



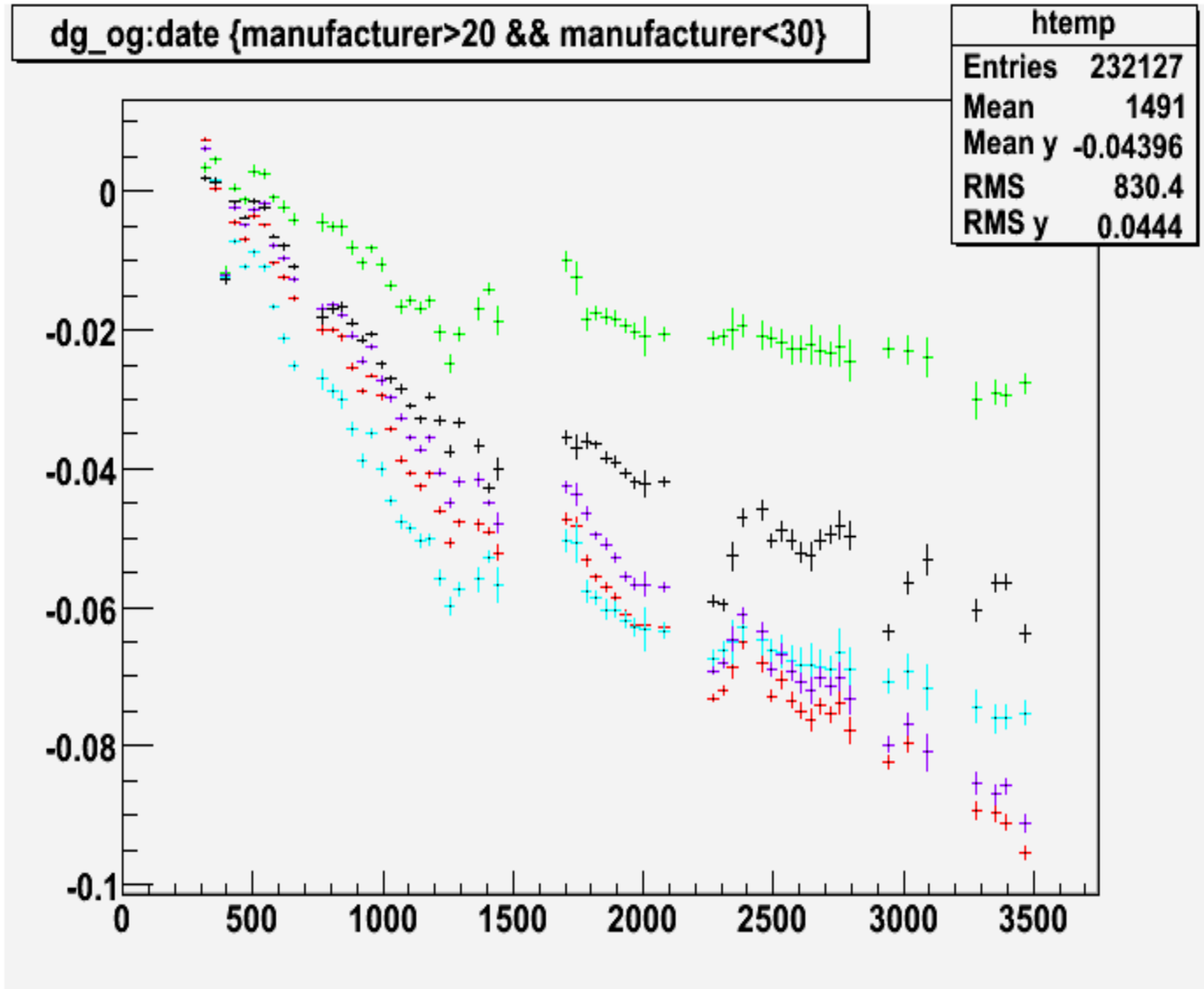
LY Falloff by manufacturer - BB



Shanghai
performs the
best

Kharkov
performs worst

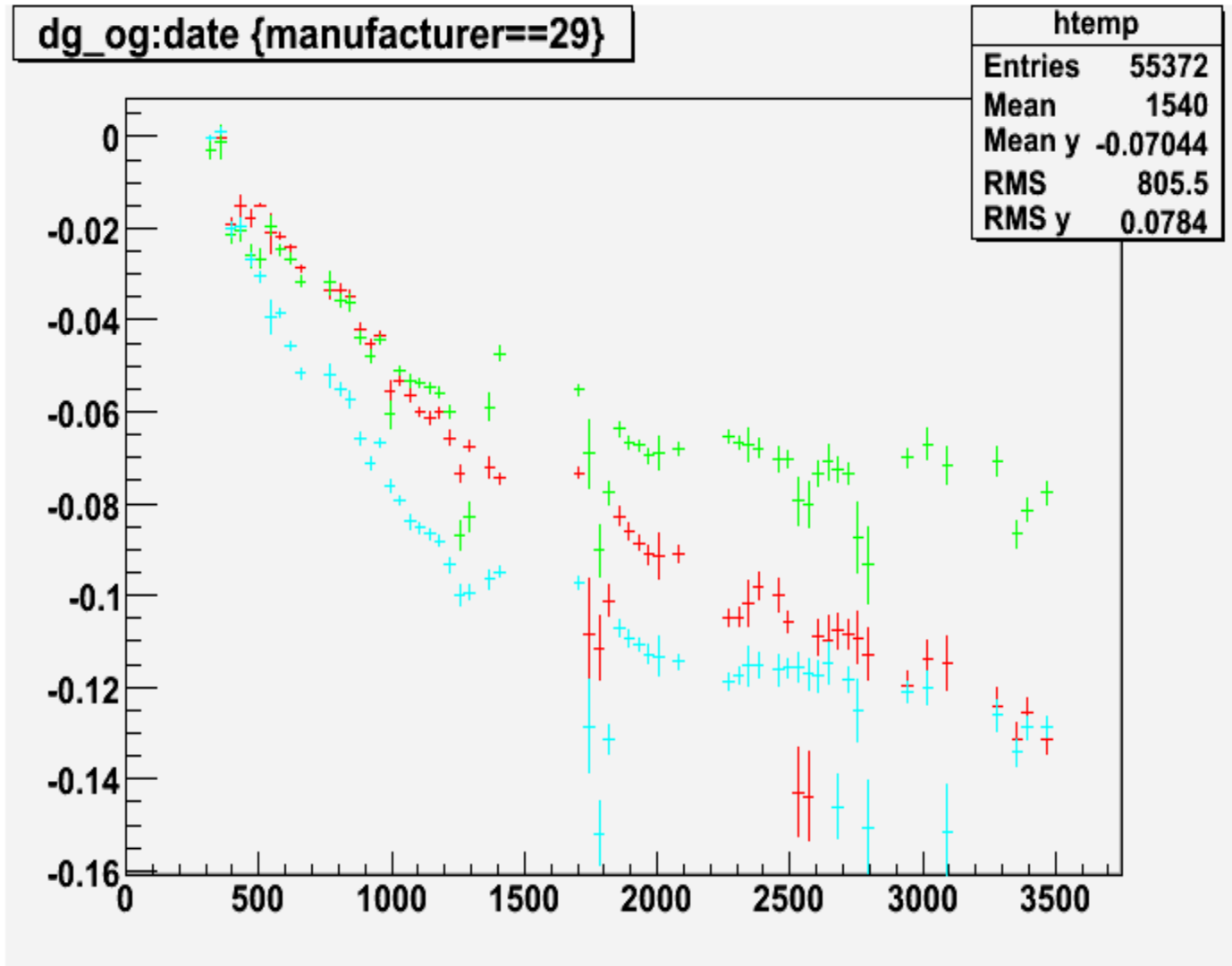
LY Falloff by manufacturer - BF



Again, Shanghai performs the best

Kharkov/Ronik as well as Hilger fall off the most

LY Falloff by manufacturer - EC

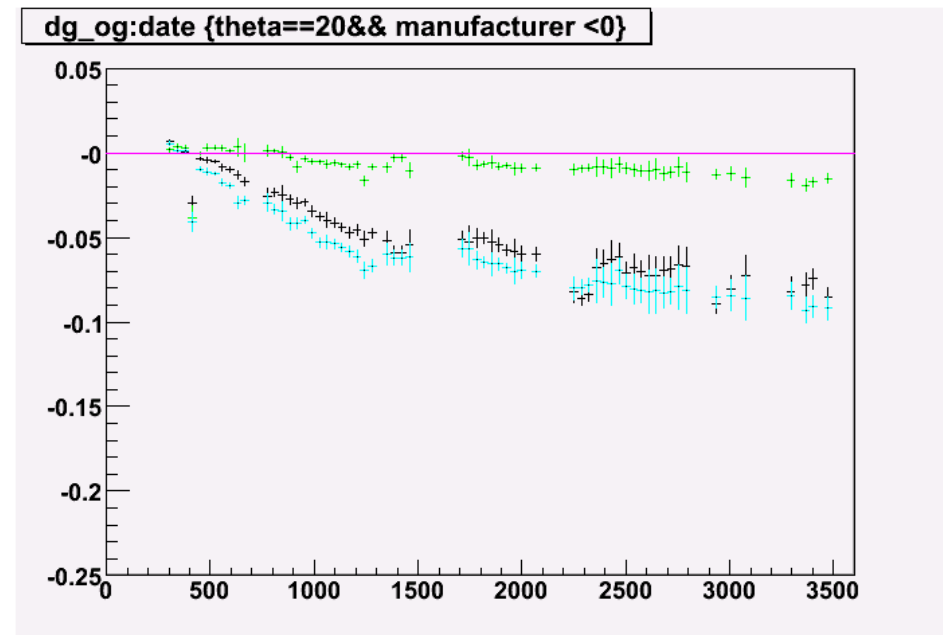
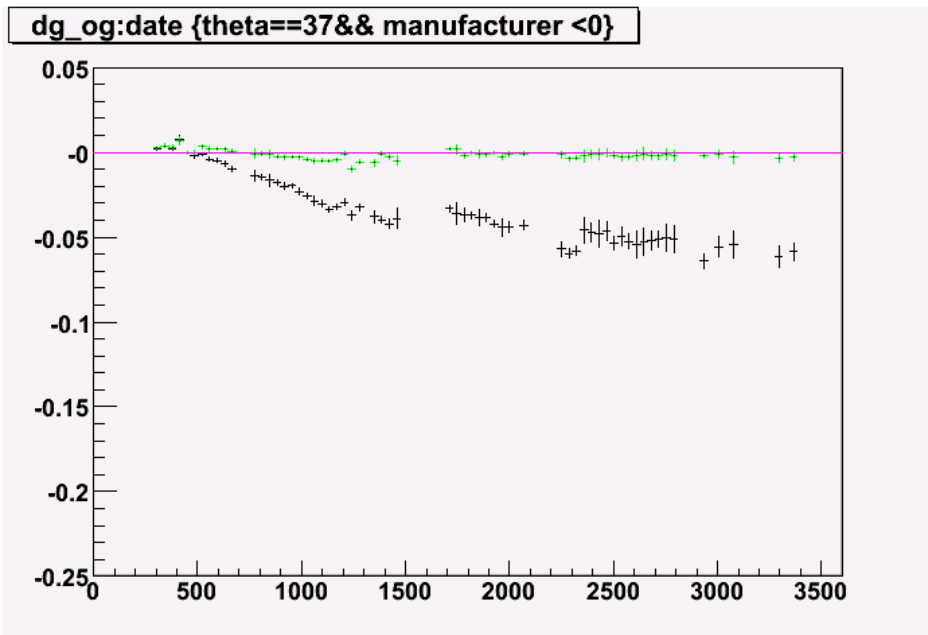


Again, Shanghai performs the best

Kharkov as well as Hilger fall off the most

Theta Ring Comparison

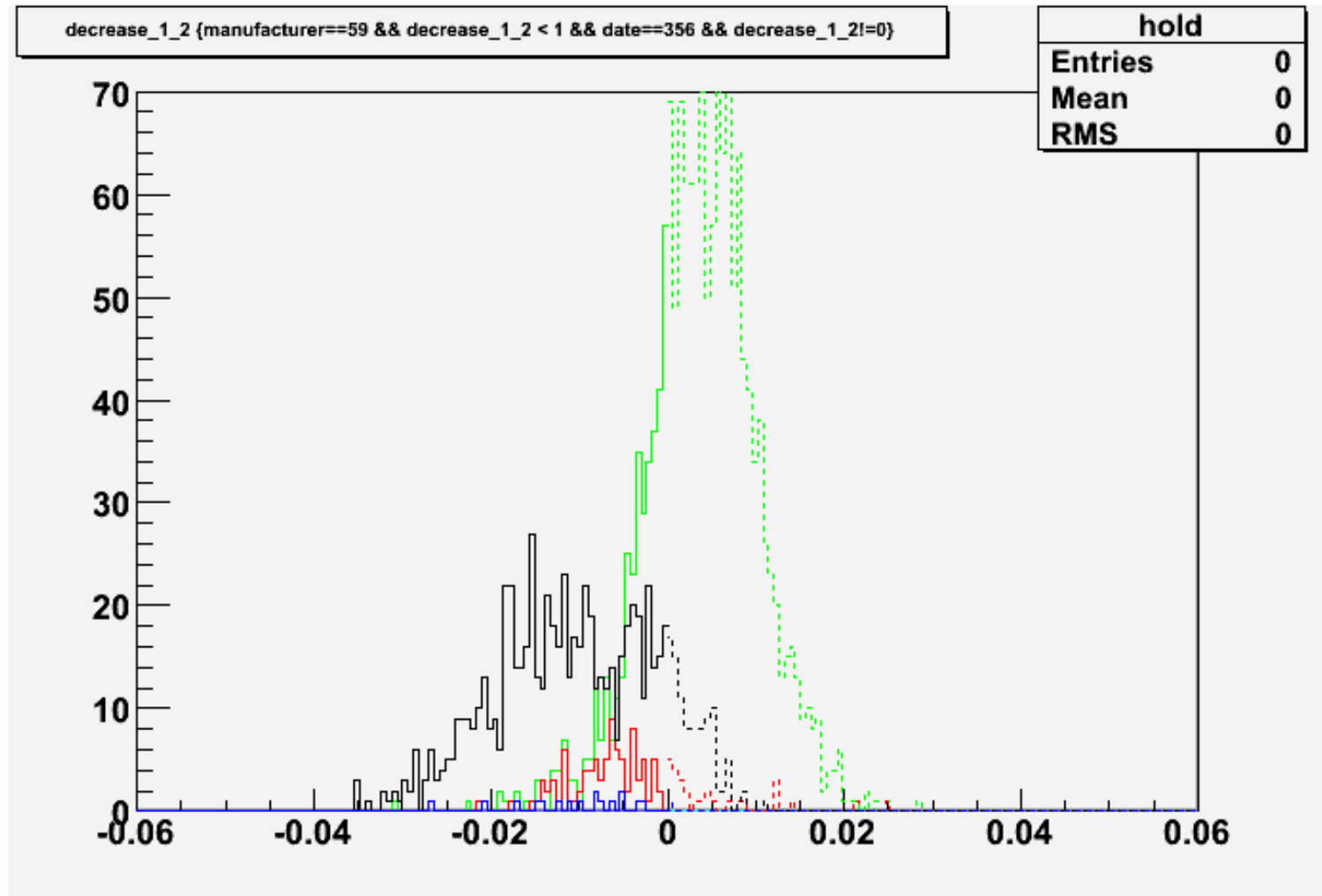
- On a theta-by-theta basis, I've also plotted the profile plots of each manufacturer, and one can find these at:
 - http://www.hep.caltech.edu/~davidd/emc_plots/profile_plots/



Recovery/Falloff during shutdown

- I checked 4 different time periods:
 - End of run 1 -> start run 2
 - End of run 3 -> start run 4
 - End of run 4 -> start run 5
 - End of run 6 -> final calibration
 - Plotted crystal's % change during these periods for all crystals with change!=0

Between Runs 1-2, BB

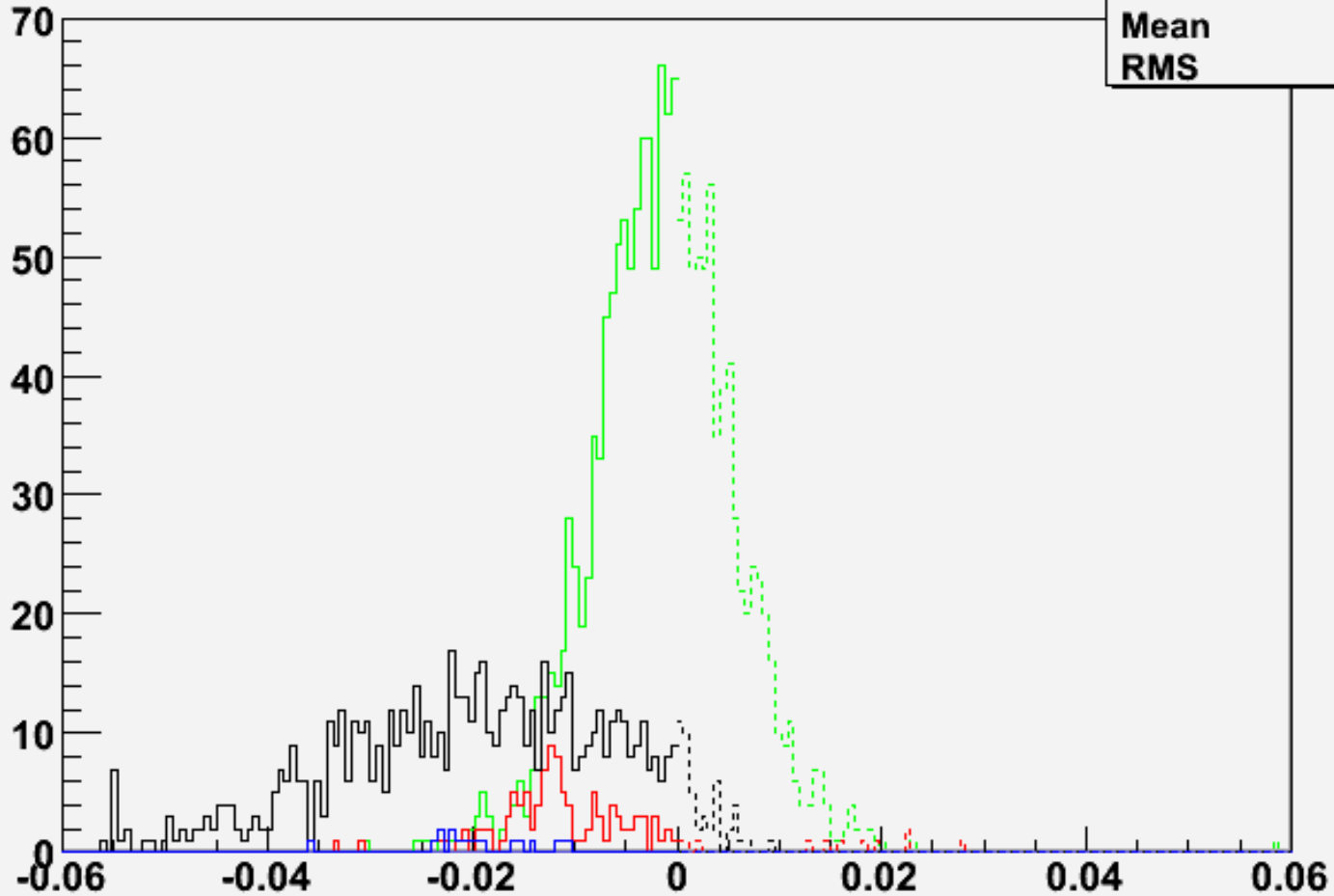


Between Runs 3-4 BB

decrease_3_4 {manufacturer==59 && decrease_3_4 < 1 && date==356 && decrease_3_4!=0}

hold

Entries	0
Mean	0
RMS	0

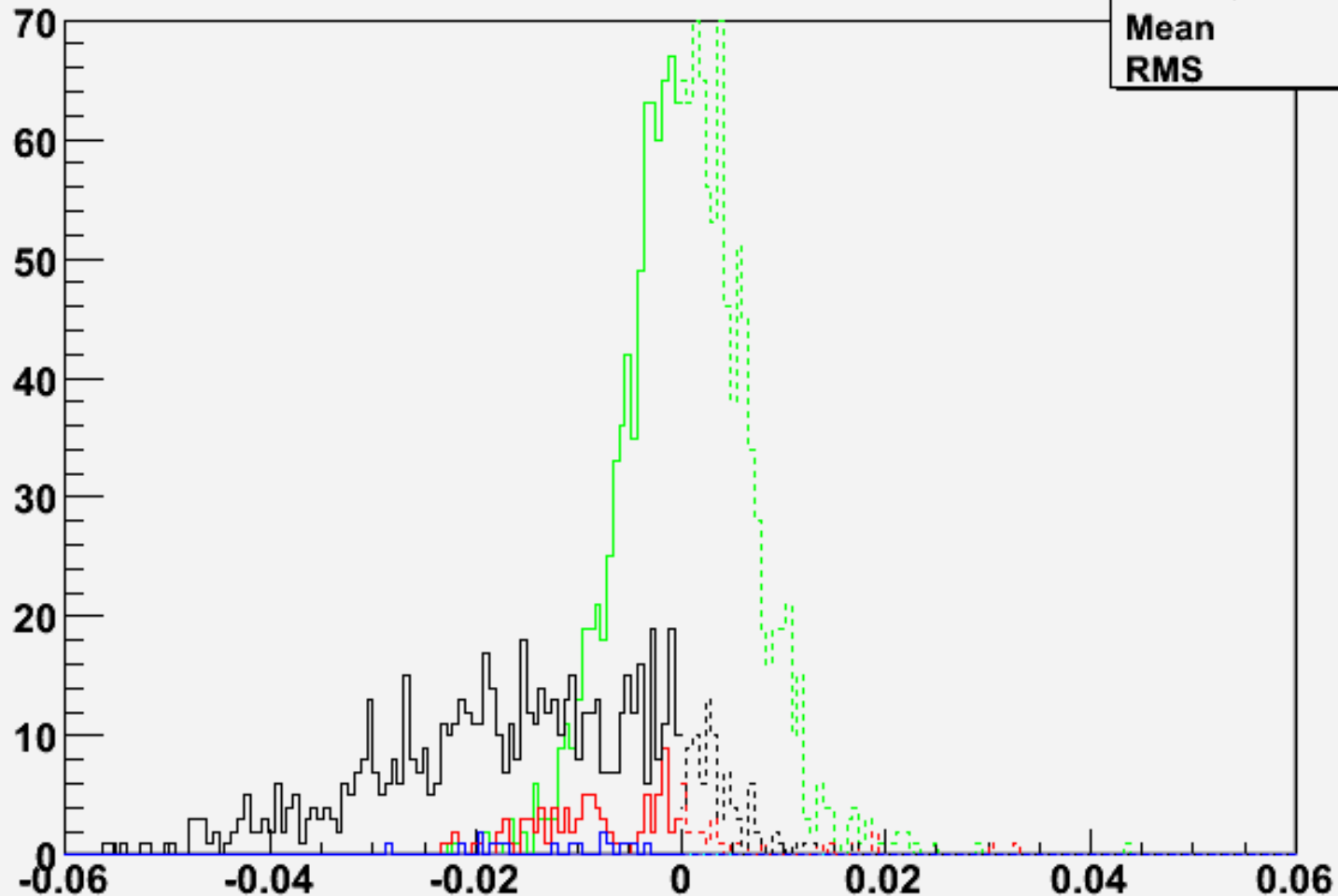


Between Runs 4-5 BB

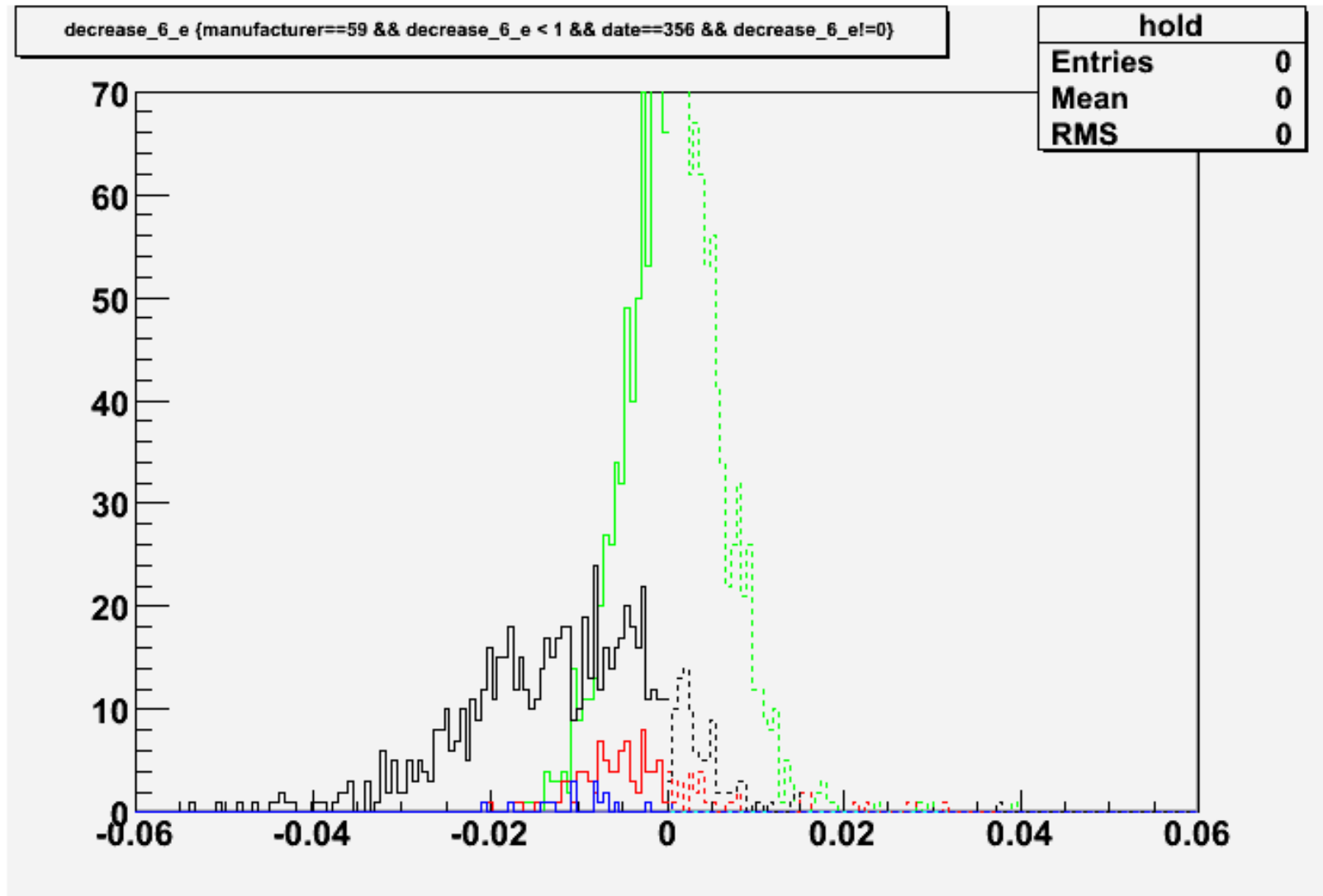
decrease_4_5 {manufacturer==59 && decrease_4_5 < 1 && date==356 && decrease_4_5!=0}

hold

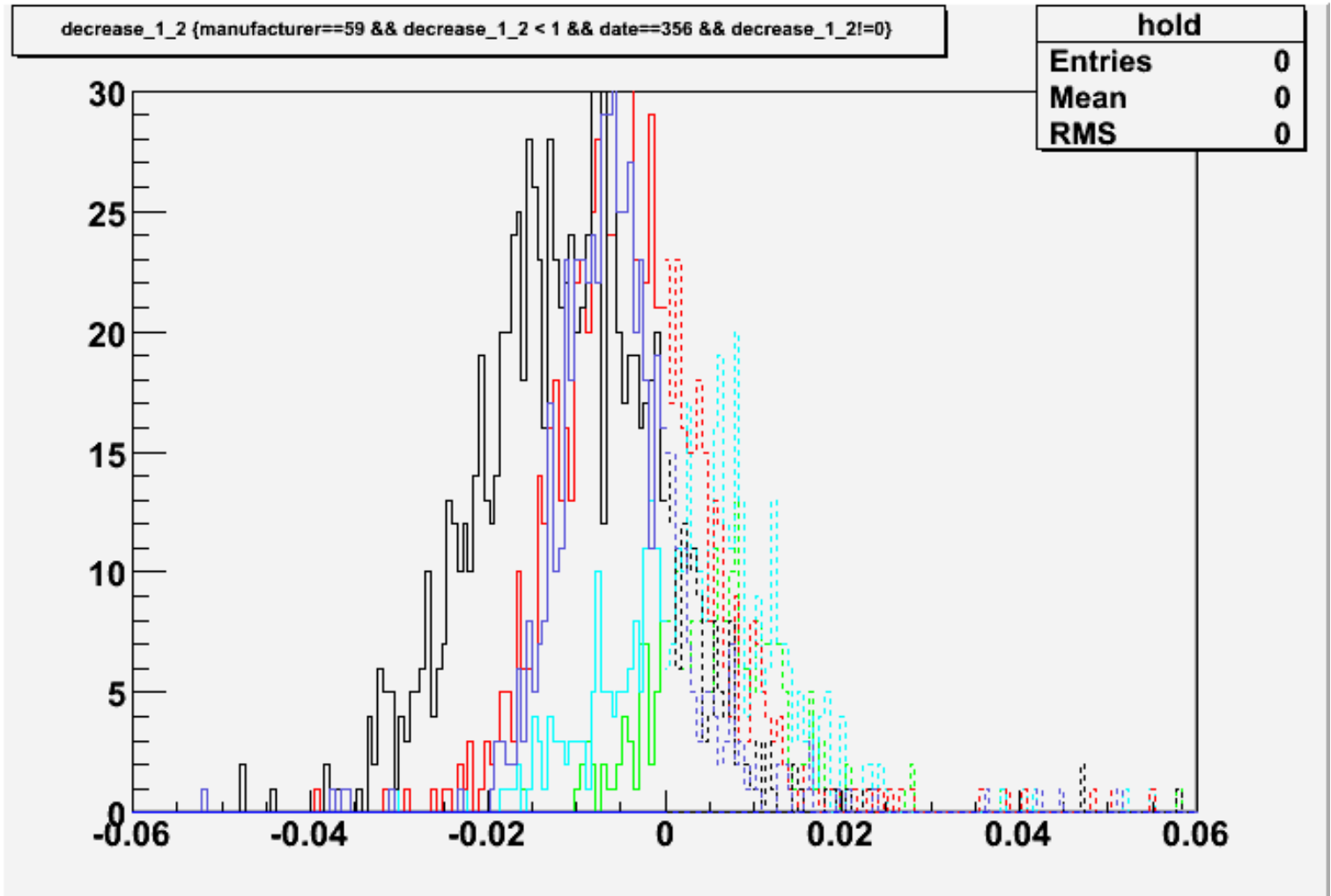
Entries	0
Mean	0
RMS	0



Between Runs 6 to end BB



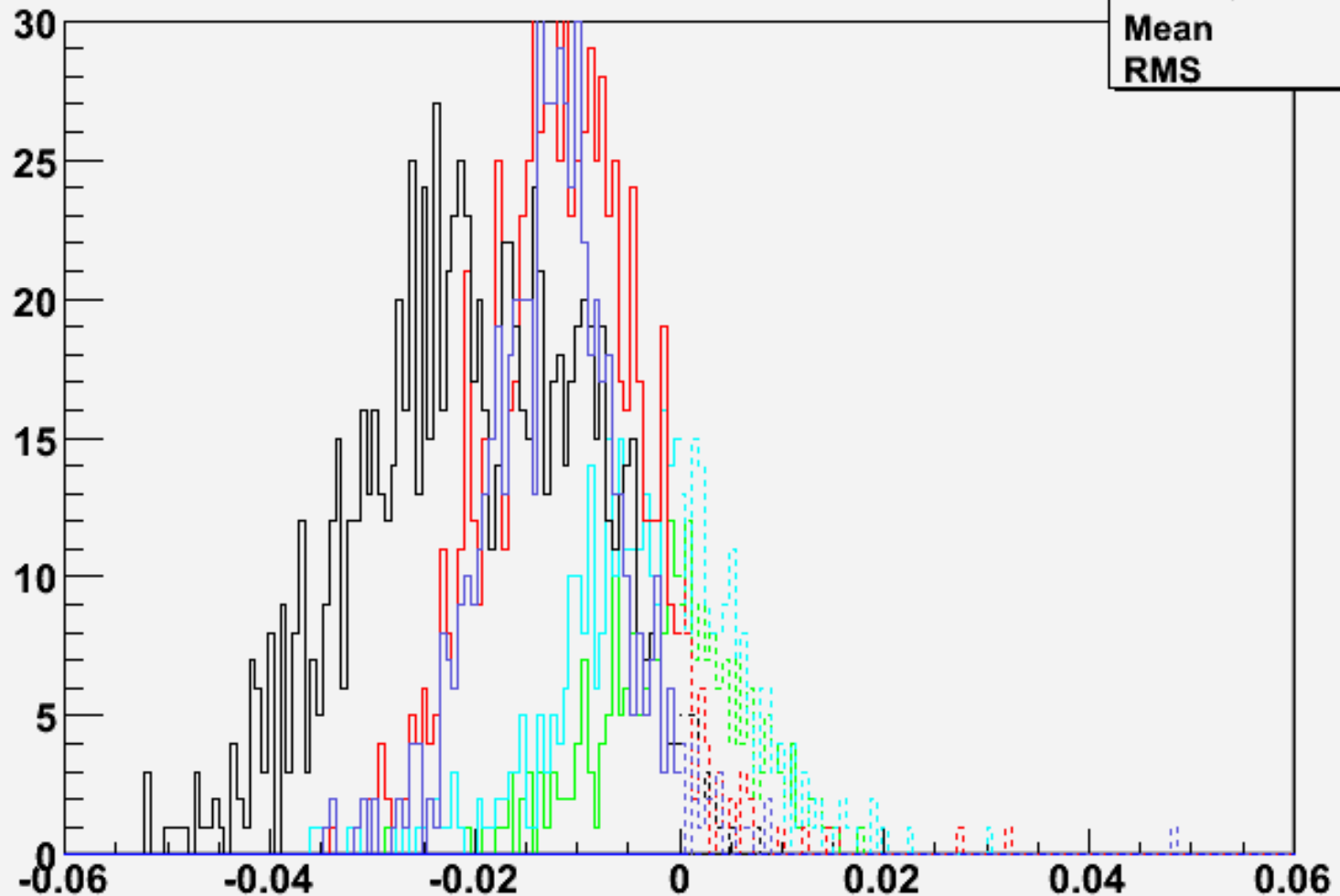
Between Runs 1-2, BF



Between Runs 3-4, BF

decrease_3_4 {manufacturer==59 && decrease_3_4 < 1 && date==356 && decrease_3_4!=0}

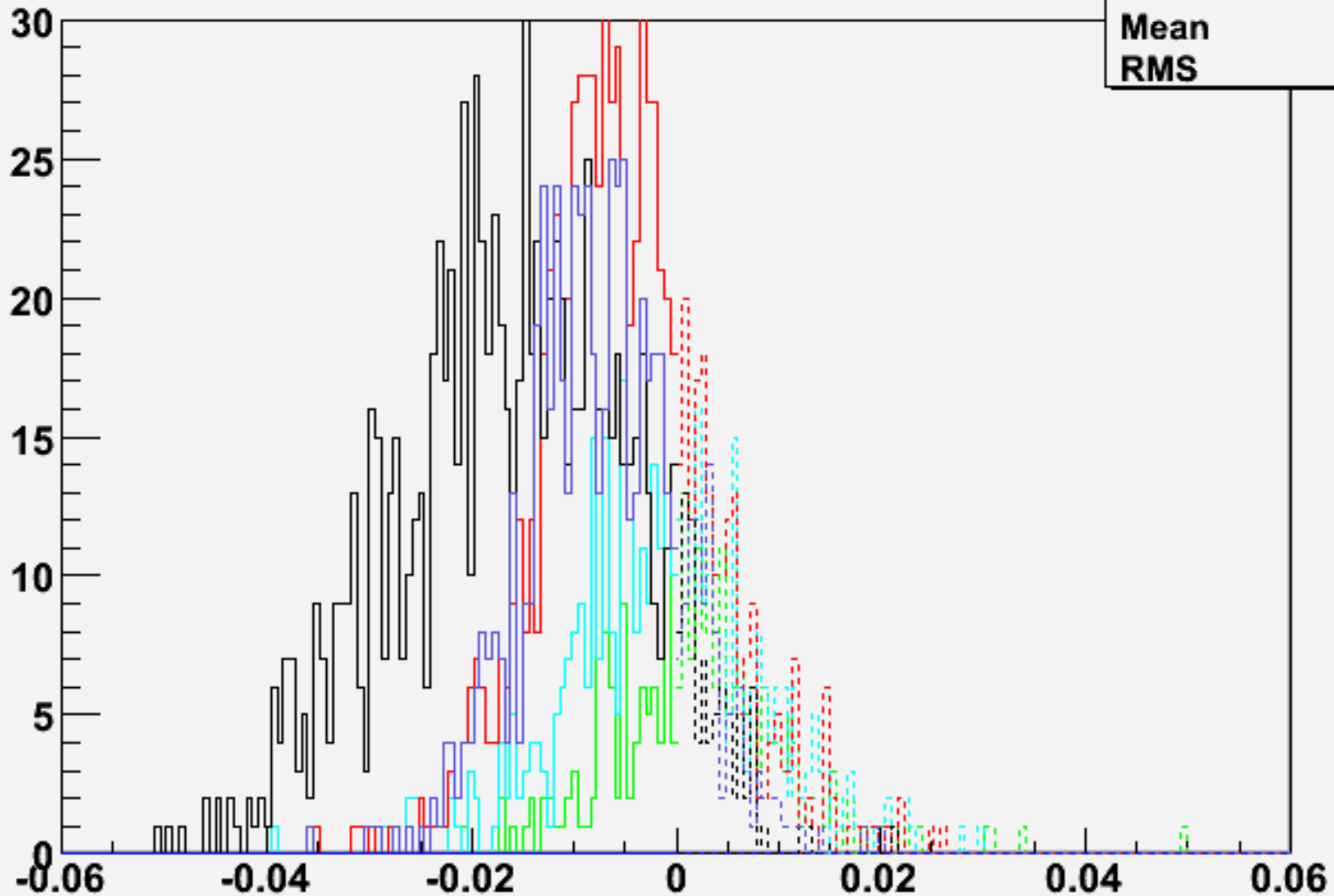
hold	
Entries	0
Mean	0
RMS	0



Between Runs 4-5, BF

decrease_4_5 {manufacturer==59 && decrease_4_5 < 1 && date==356 && decrease_4_5!=0}

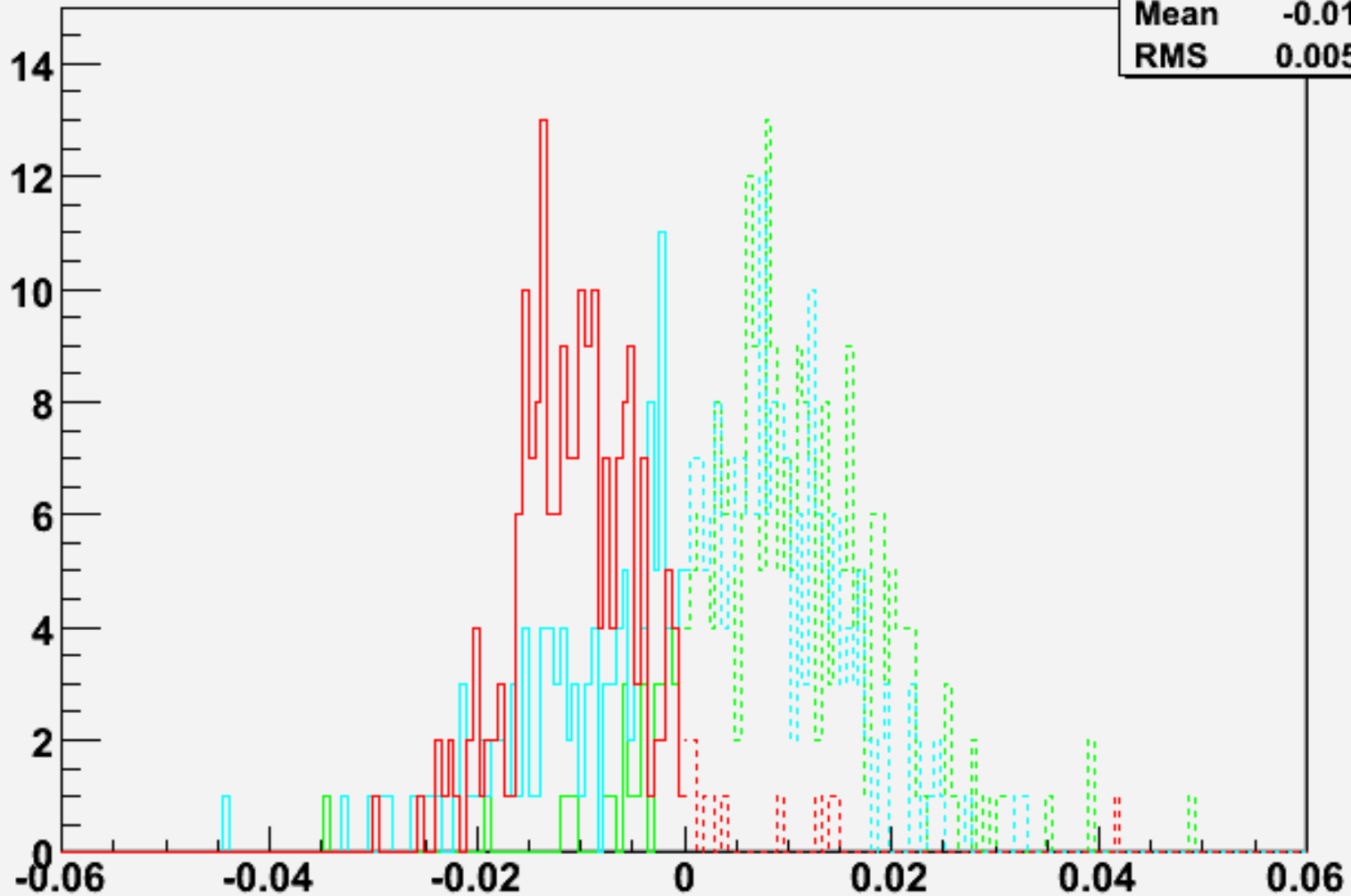
hold	
Entries	0
Mean	0
RMS	0



Between Runs 1-2, EC

decrease_1_2 {manufacturer==59 && decrease_1_2 < 1 && date==356 && decrease_1_2!=0}

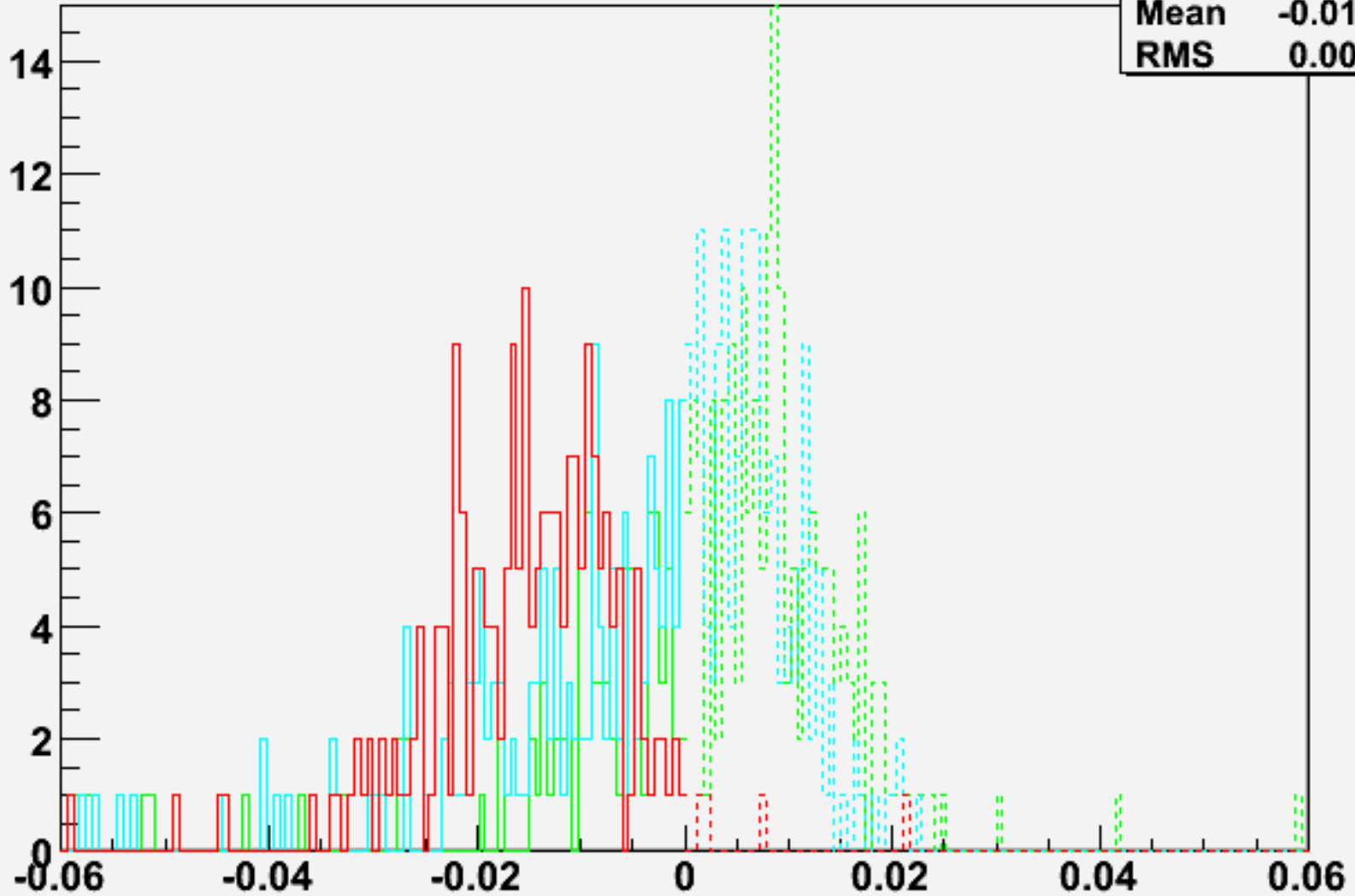
Khar_decrease	
Entries	196
Mean	-0.01084
RMS	0.005446



Between Runs 3-4, EC

decrease_3_4 {manufacturer==59 && decrease_3_4 < 1 && date==356 && decrease_3_4!=0}

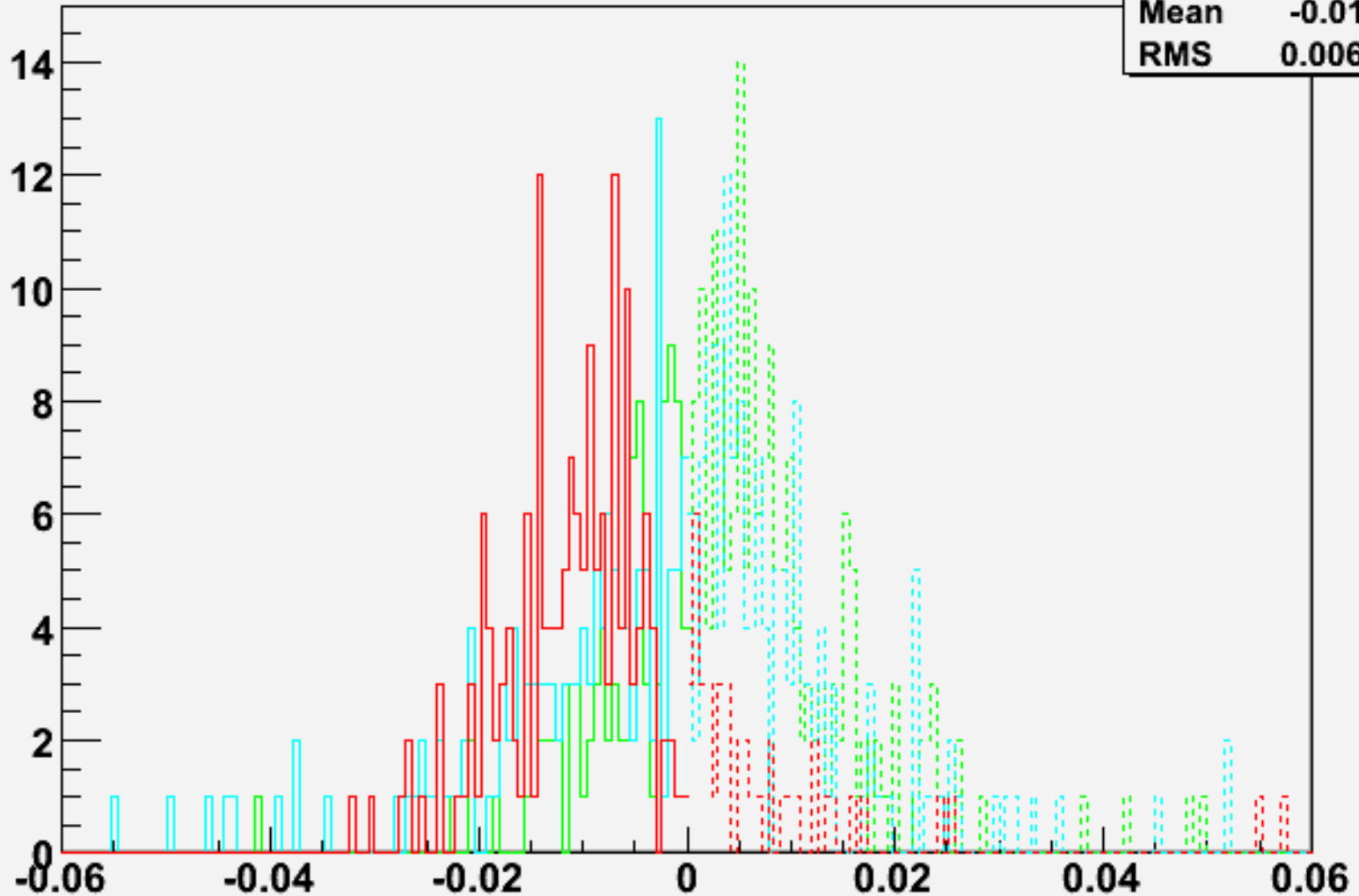
Khar_decrease	
Entries	205
Mean	-0.01577
RMS	0.00882



Between Runs 4-5, EC

decrease_4_5 {manufacturer==59 && decrease_4_5 < 1 && date==356 && decrease_4_5!=0}

Khar_decrease	
Entries	164
Mean	-0.01156
RMS	0.006236

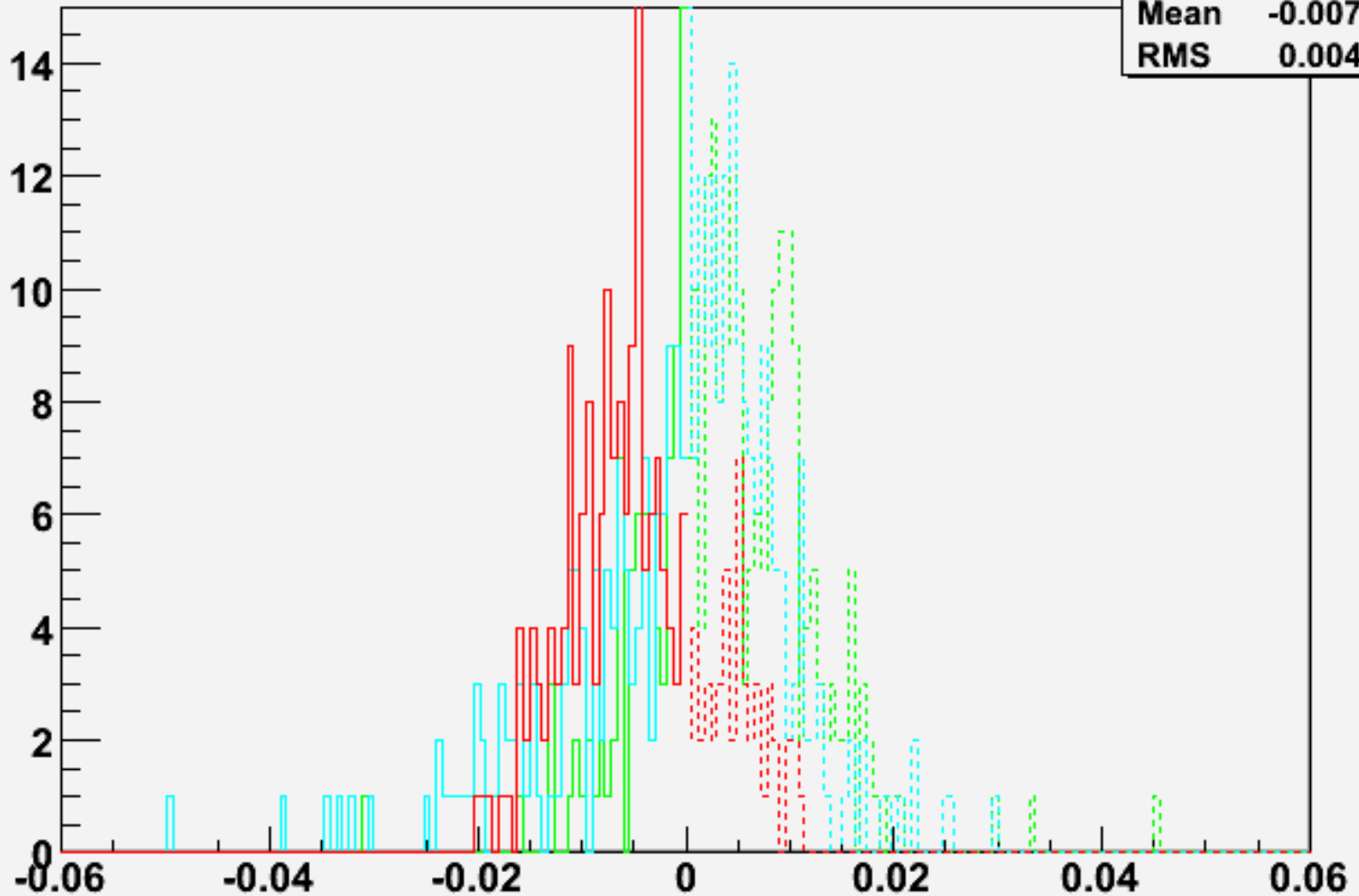


Between Runs 6-end, EC

decrease_6_e {manufacturer==59 && decrease_6_e < 1 && date==356 && decrease_6_e!=0}

Khar_decrease

Entries	159
Mean	-0.007553
RMS	0.004497



Conclusions

- Shanghai crystals in general perform the best as far as stability in light yield
- Light yield falloff is consistent with previous study
- Downtimes show falloff in some crystals
 - A lot in Crismatec
 - Moderate in Kharkov
- Suggestions?