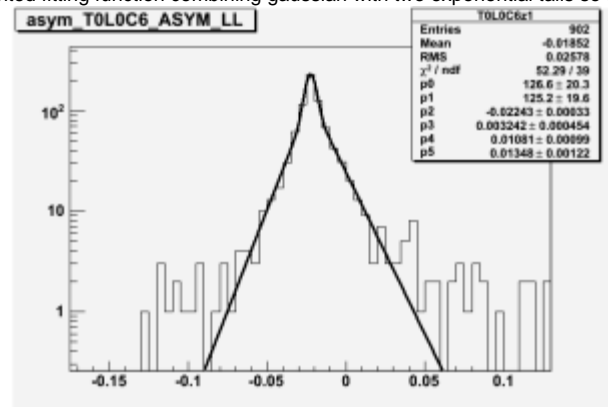


# Status of CAL asymmetry maps generation

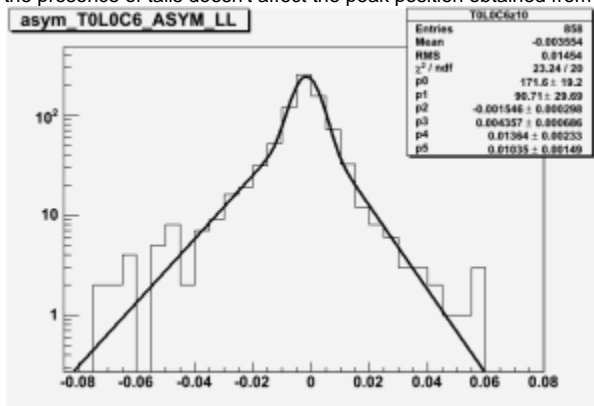
The asymmetry calibration based on August -September 2008 data was generated some time ago and tested by reprocessing earth limb data.

Since then I've made several improvements to asymmetry calibration code to decrease possible systematic errors:

- as asymmetry histograms for heavy ions have significant tails, I implemented fitting function combining gaussian with two exponential tails so that

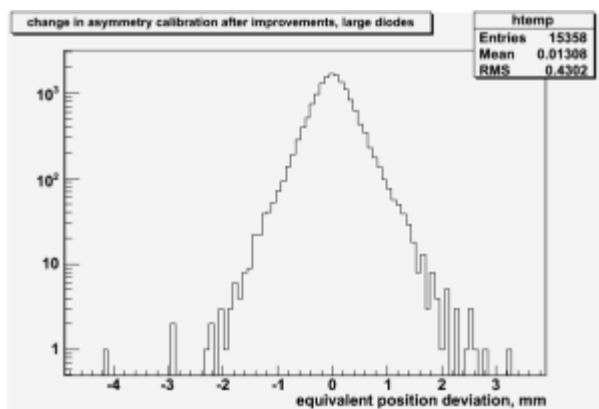


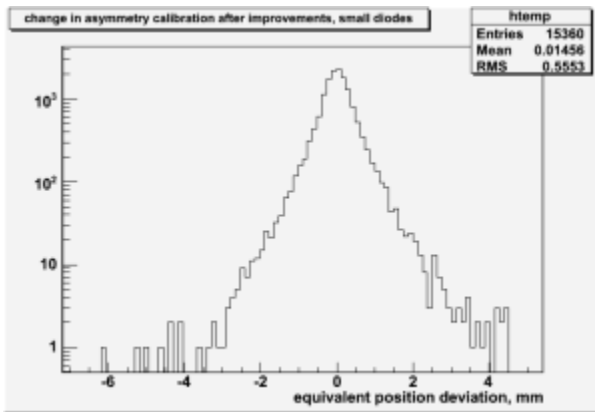
the presence of tails doesn't affect the peak position obtained from the fit.



- the existing code made rebinning of asymmetry histograms for small diodes by grouping bins by 4 (this was optimized for ground calibration where signal to noise ratio was smaller) - I suppressed this rebinning
- the existing code required that track cross both top and bottom surfaces of the crystal at the distance more than 30 mm from crystal end. Together with broad theta angle distribution this cause very nonuniform event distribution in the crystal segments 1 and 10 biasing the asymmetry histogram - I suppressed this selection. Requirement to cross crystal center at more than 27 mm (crystal segment width) is sufficient to avoid direct light effects.
- to decrease the nonuniformity effect (previous item) in existing code we plot the difference between calculated asymmetry and linear model, but we used average slope for all crystals. Now I use individual slope for each crystal

The change in asymmetry calibration (for the same August-September 2008 period) after these improvements illustrated on the following plots for large and small diodes:





For some crystals the improvements was significant, while in average the effect is modest (about 0.5 mm).

Using this improved version of calibration code I've generated asymmetry calibration files for 6 periods of 6 Ms each, covering first year of FERMI operation.

The following plot shows the difference asymmetry calibration for each time period with respect to the first one (August-September 2008).

