

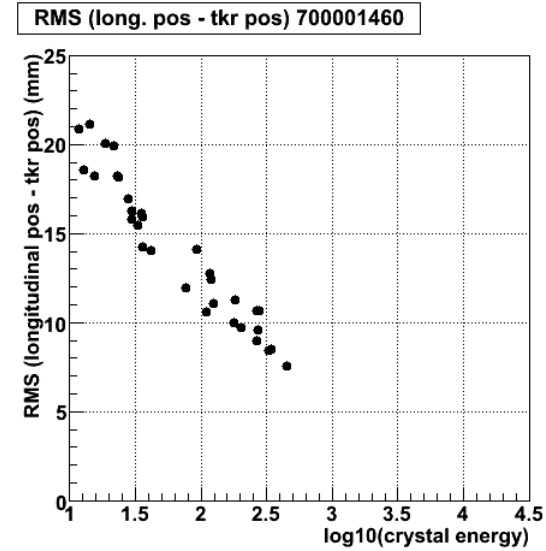
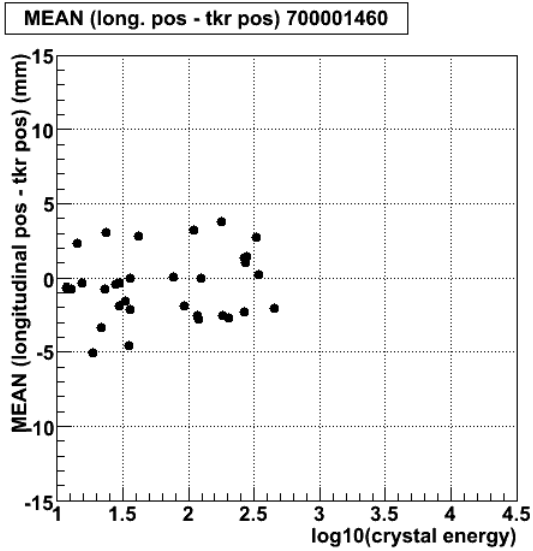


# Crystal longitudinal position measurement in electrons runs

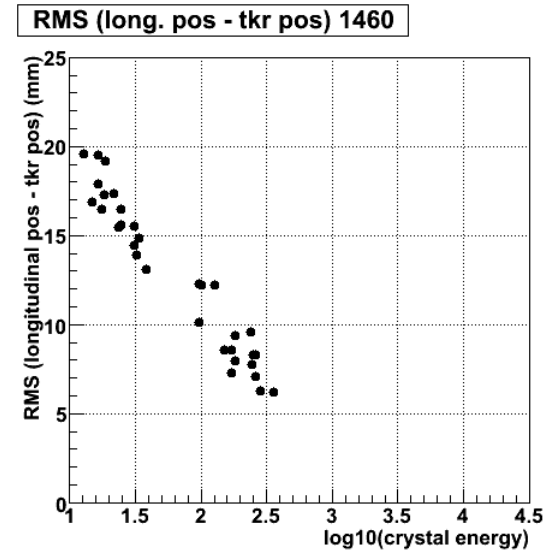
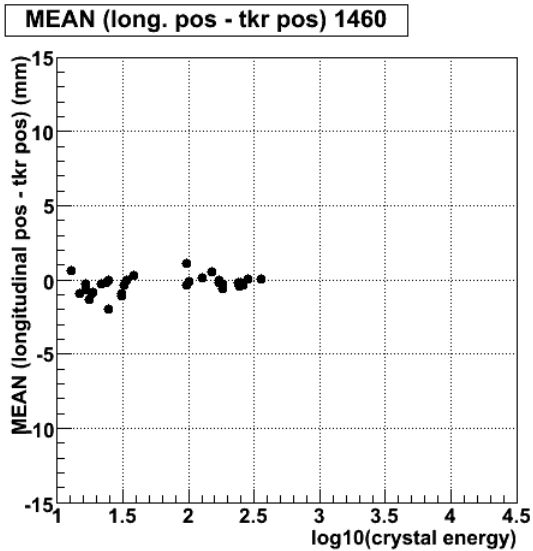
- I only look at crystals columns 5 to 8 in all layers of tower 2
- Estimate the mean and rms of (cal longitudinal position - tracker extrapolated position)
- Look how they vary with  $\log_{10}(\text{crystal energy})$
- At 282 GeV : the beam is in both columns 6 and 7, so the energy in column 6 is sometimes high and sometimes low -> the distribution of (long. pos - tkr pos) can have two peaks

# 5 GeV 0 deg (700001460)

DATA

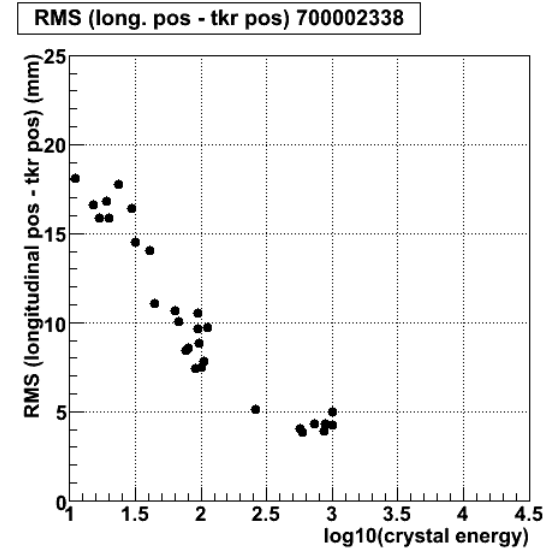
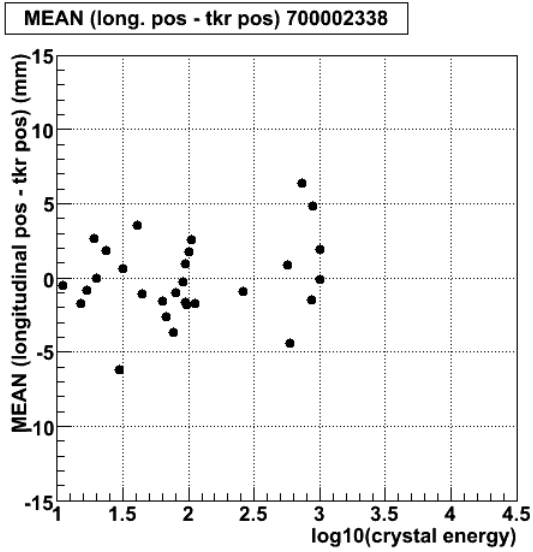


MC

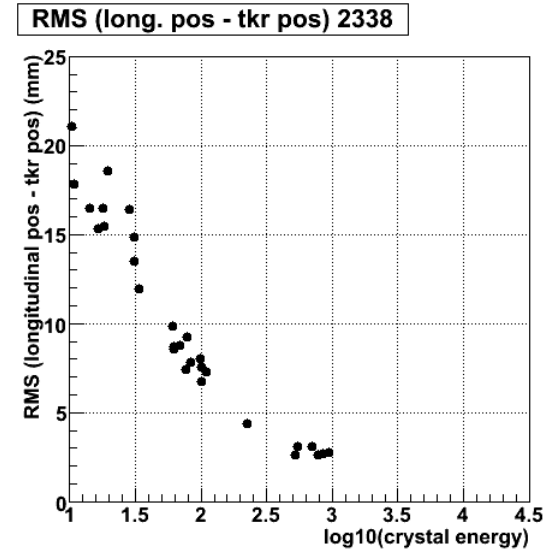
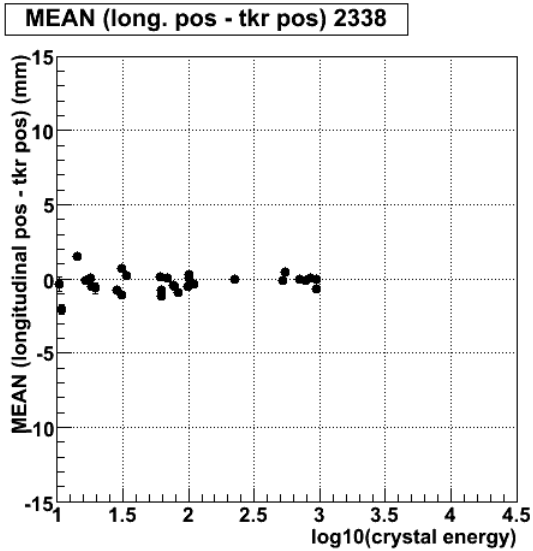


# 10 GeV 0 deg (700002338)

DATA



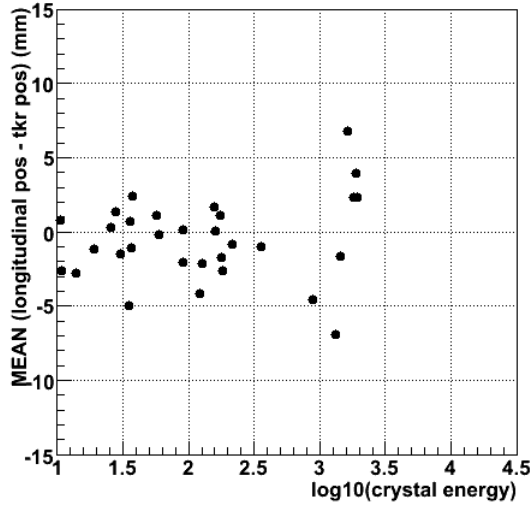
MC



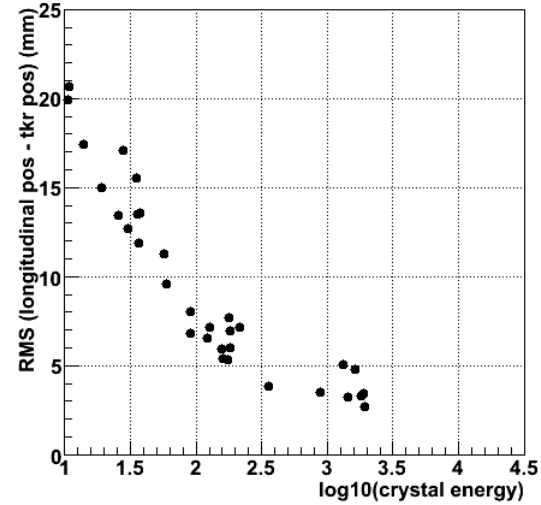
# 20 GeV 0 deg (700002082)

DATA

MEAN (long. pos - tkr pos) 700002082

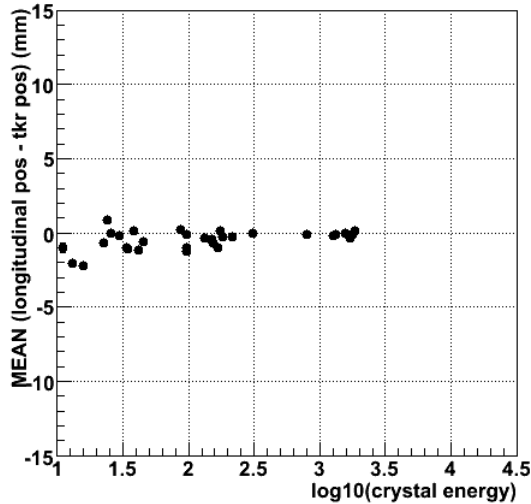


RMS (long. pos - tkr pos) 700002082

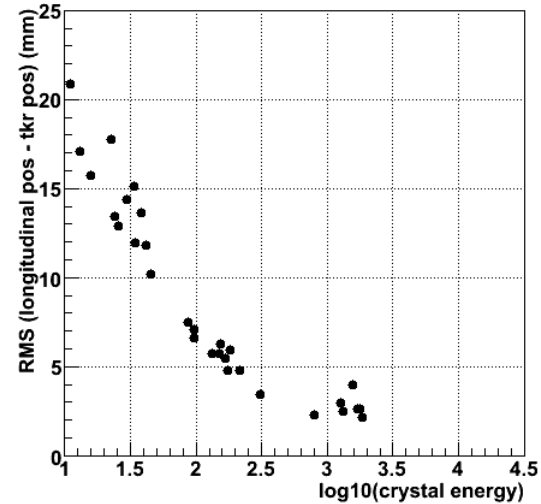


MC

MEAN (long. pos - tkr pos) 2082

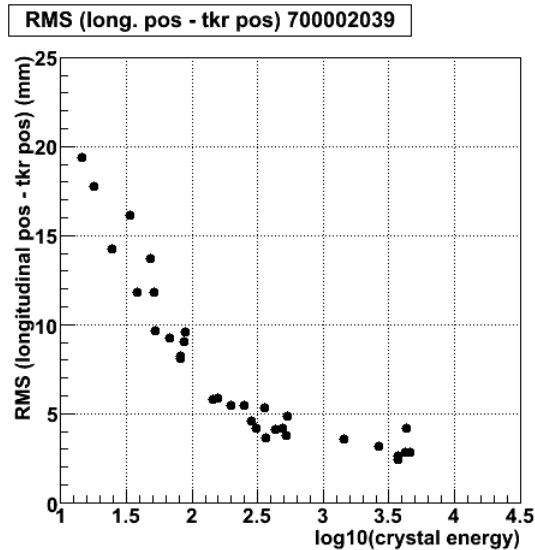
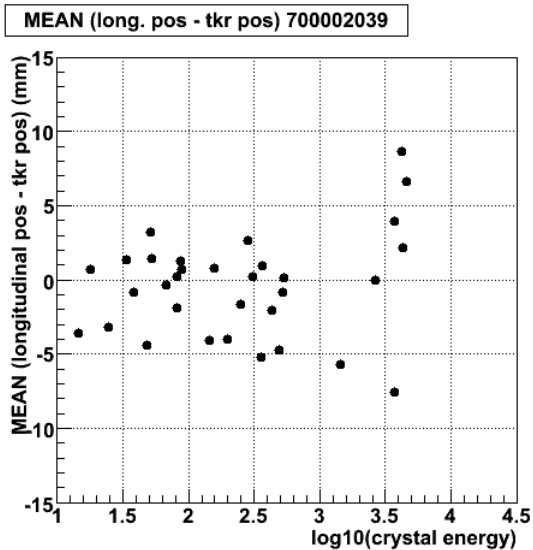


RMS (long. pos - tkr pos) 2082

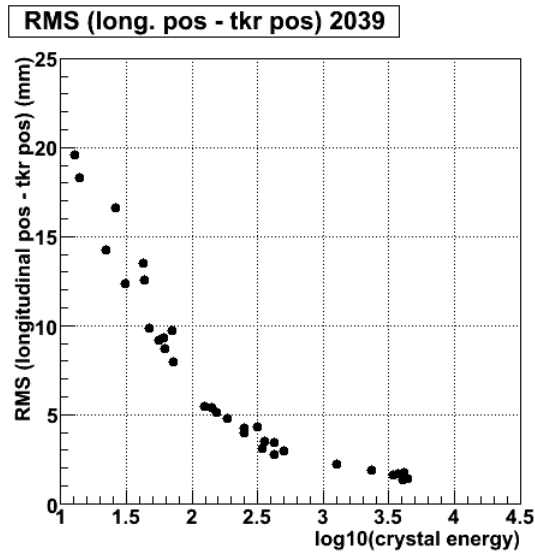
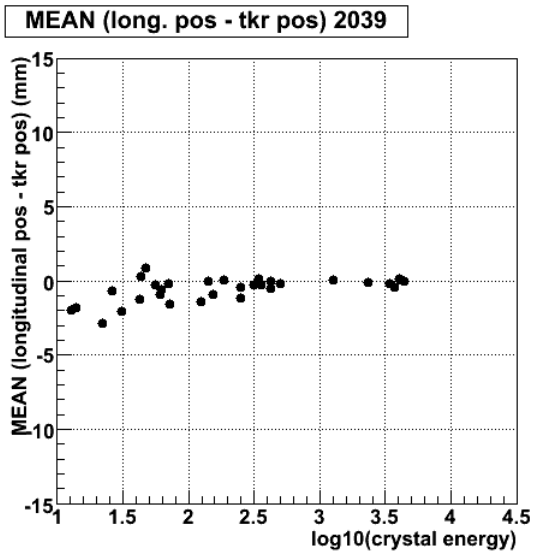


# 50 GeV 0 deg (700002039)

DATA

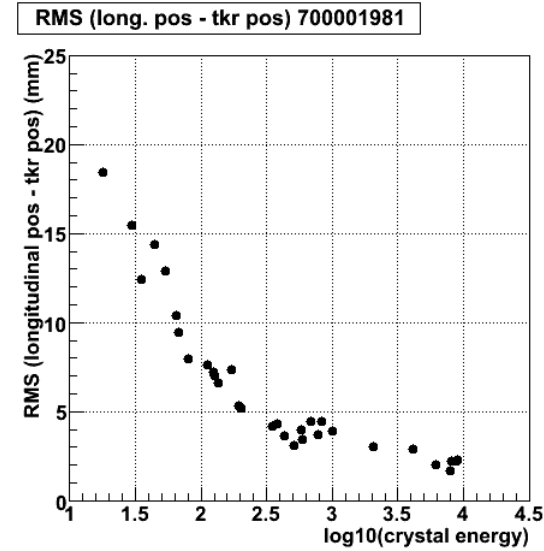
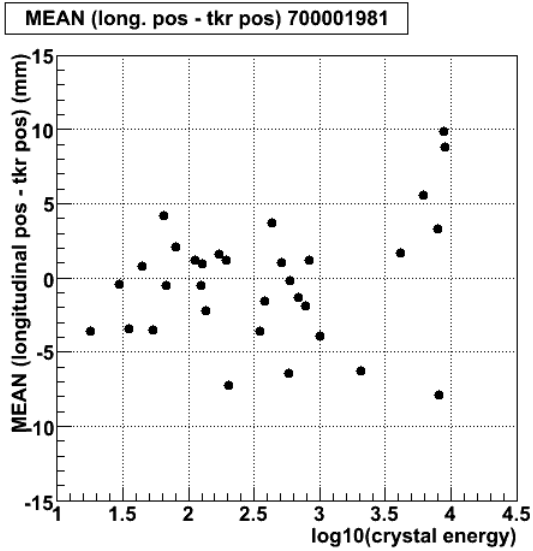


MC

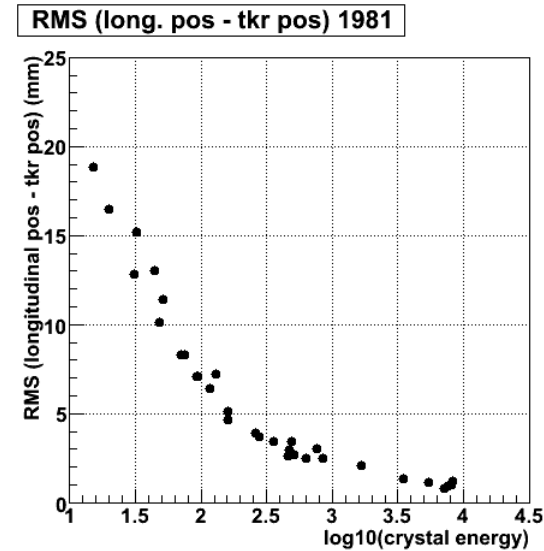
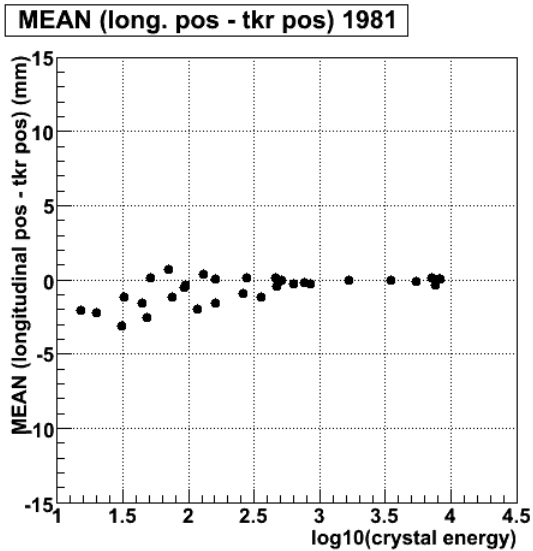


# 100 GeV 0 deg (700001981)

DATA

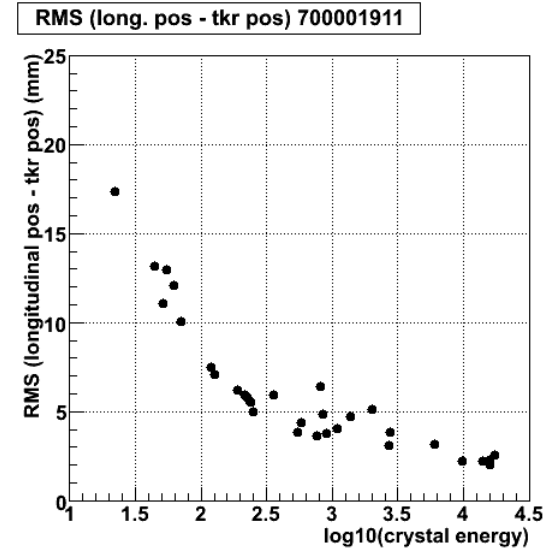
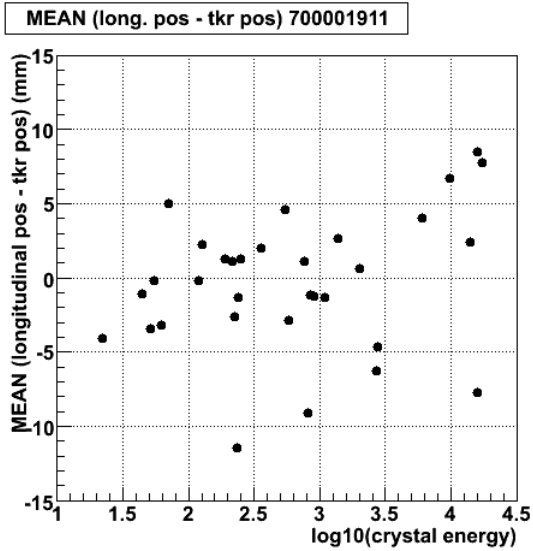


MC

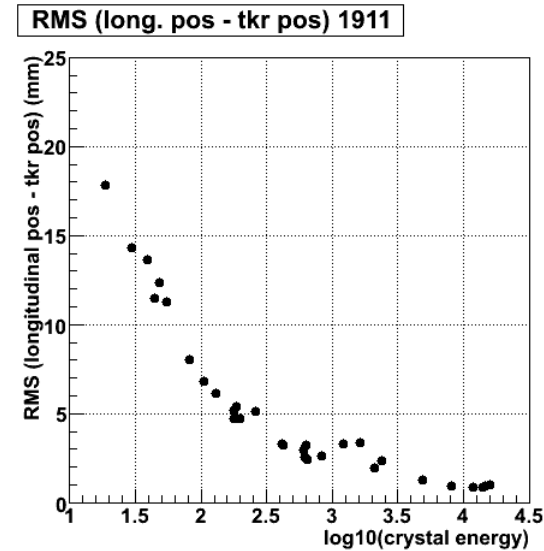
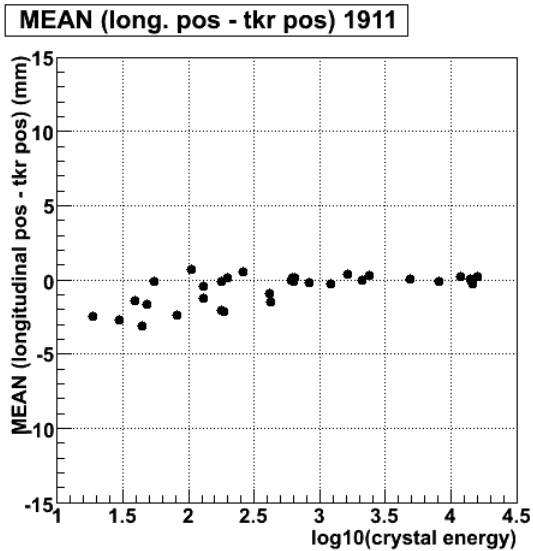


# 196 GeV 0 deg (700001911)

DATA



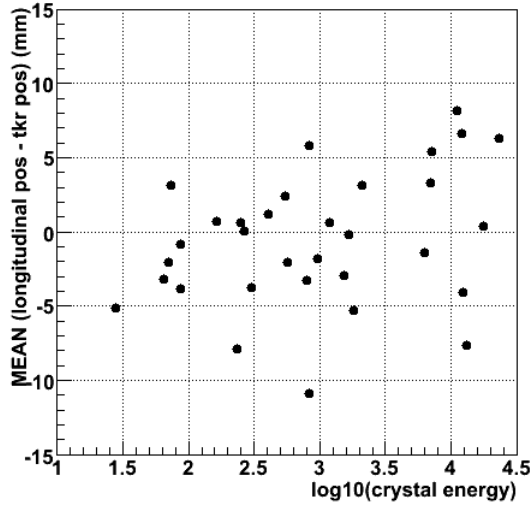
MC



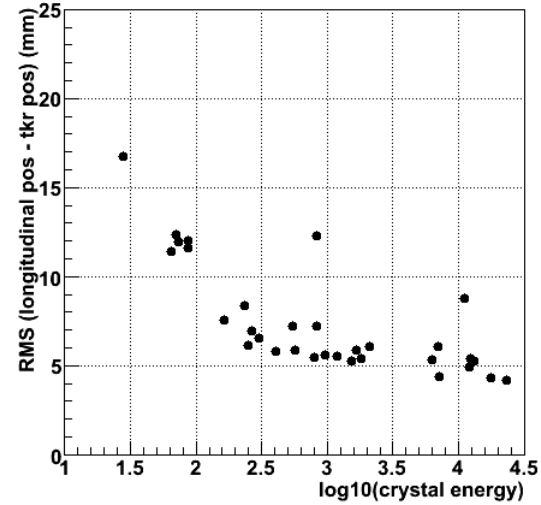
# 282 GeV 0 deg (700001922)

DATA

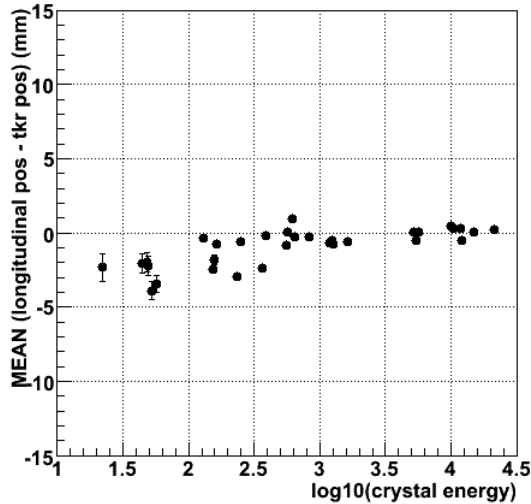
MEAN (long. pos - tkr pos) 700001922



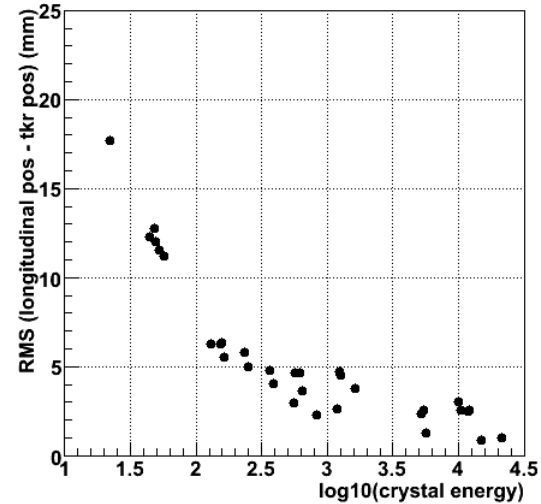
RMS (long. pos - tkr pos) 700001922



MEAN (long. pos - tkr pos) 1922



RMS (long. pos - tkr pos) 1922



MC



# Conclusions

---

- There is a clear difference between data and MC
- In data, the crystal longitudinal position measurement can be wrong by 5 to 10 mm
- The longitudinal position gets wrong when the crystal energy is large
- It seems that the longitudinal position for low energy crystals ( $<1$  GeV) gets worse when the beam energy is very high
- At the contrary, there is a good agreement between data and MC for the RMS