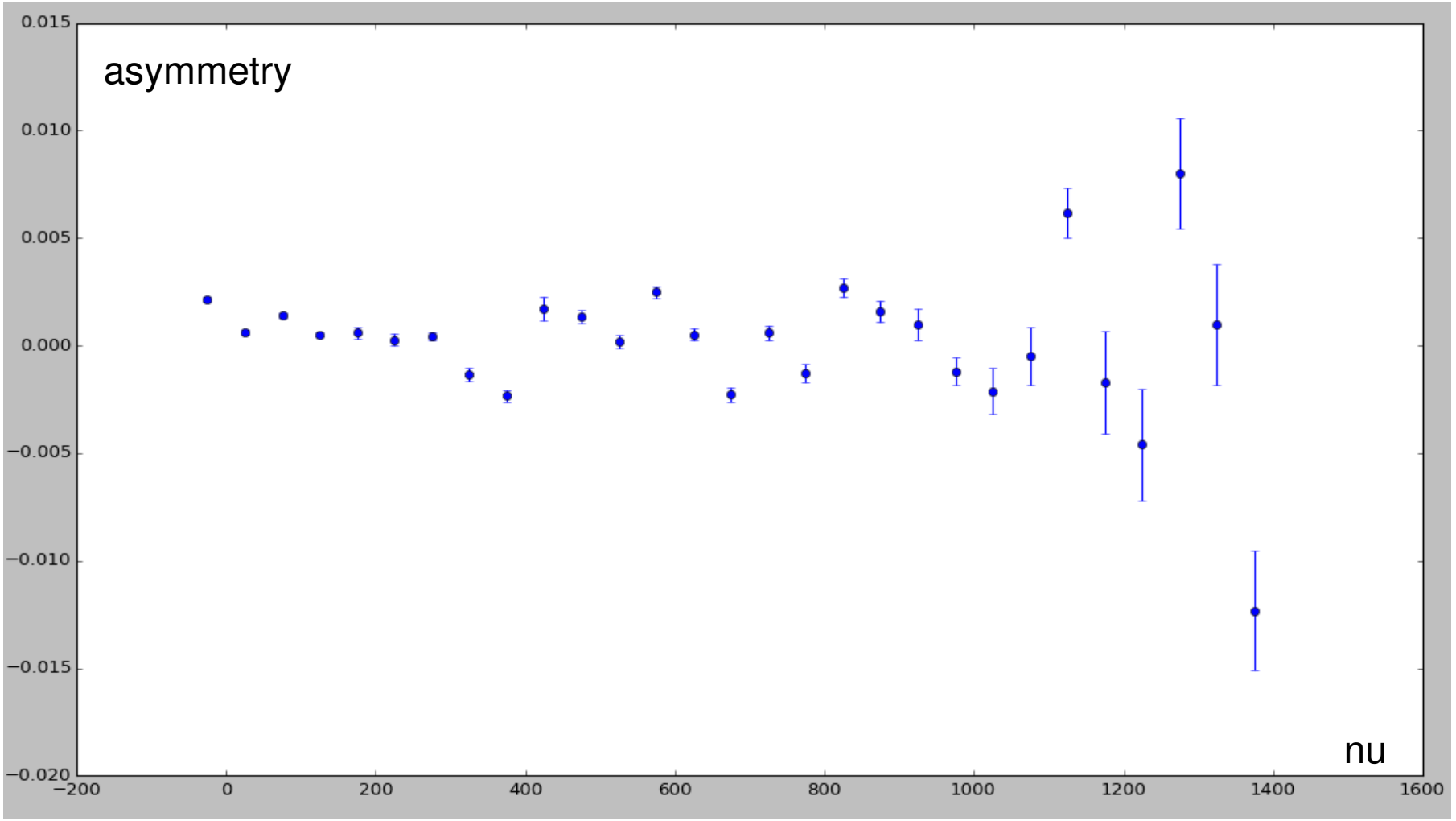
Physics asymmetry for different acceptance

raw result for setting: 2.2GeV, 5T, transverse field, material ID:19, left arm, 5.9~5.14

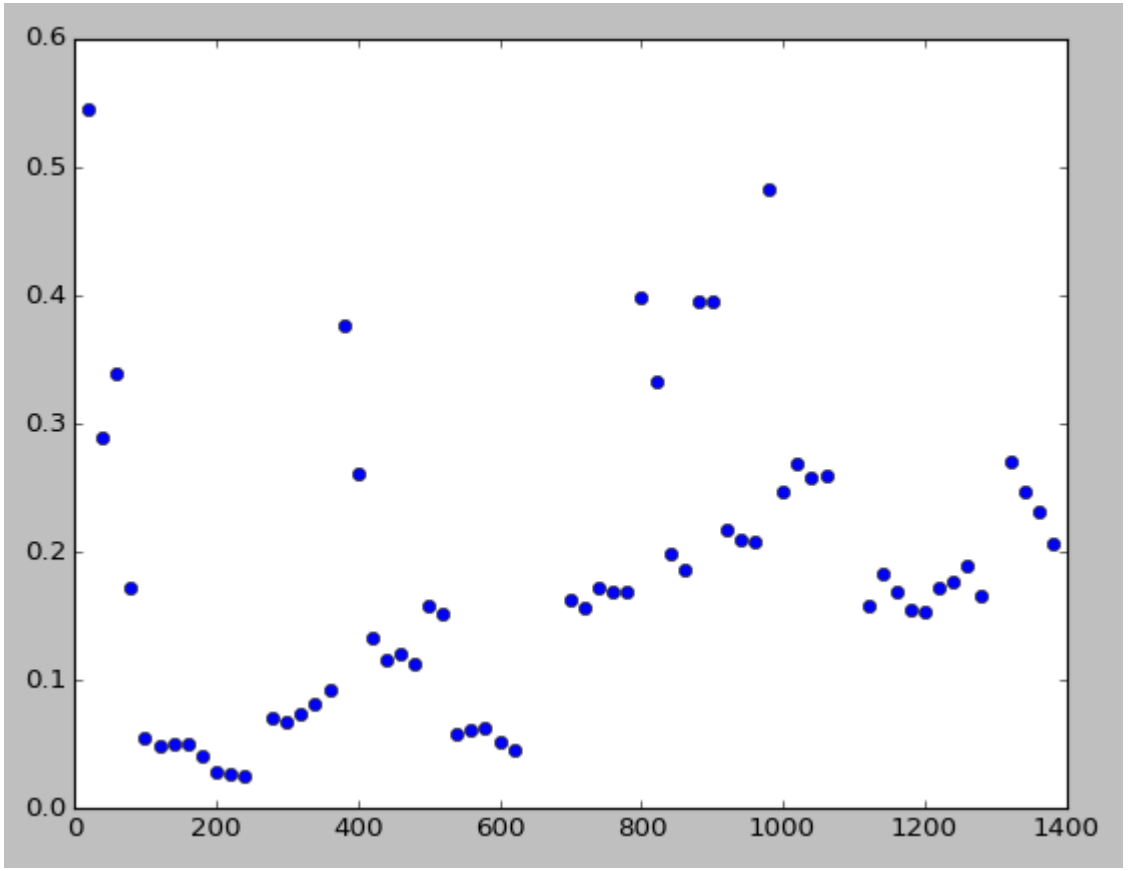
Pengjia Zhu

Physics asymmetry, set dilution=1, no acceptance cut

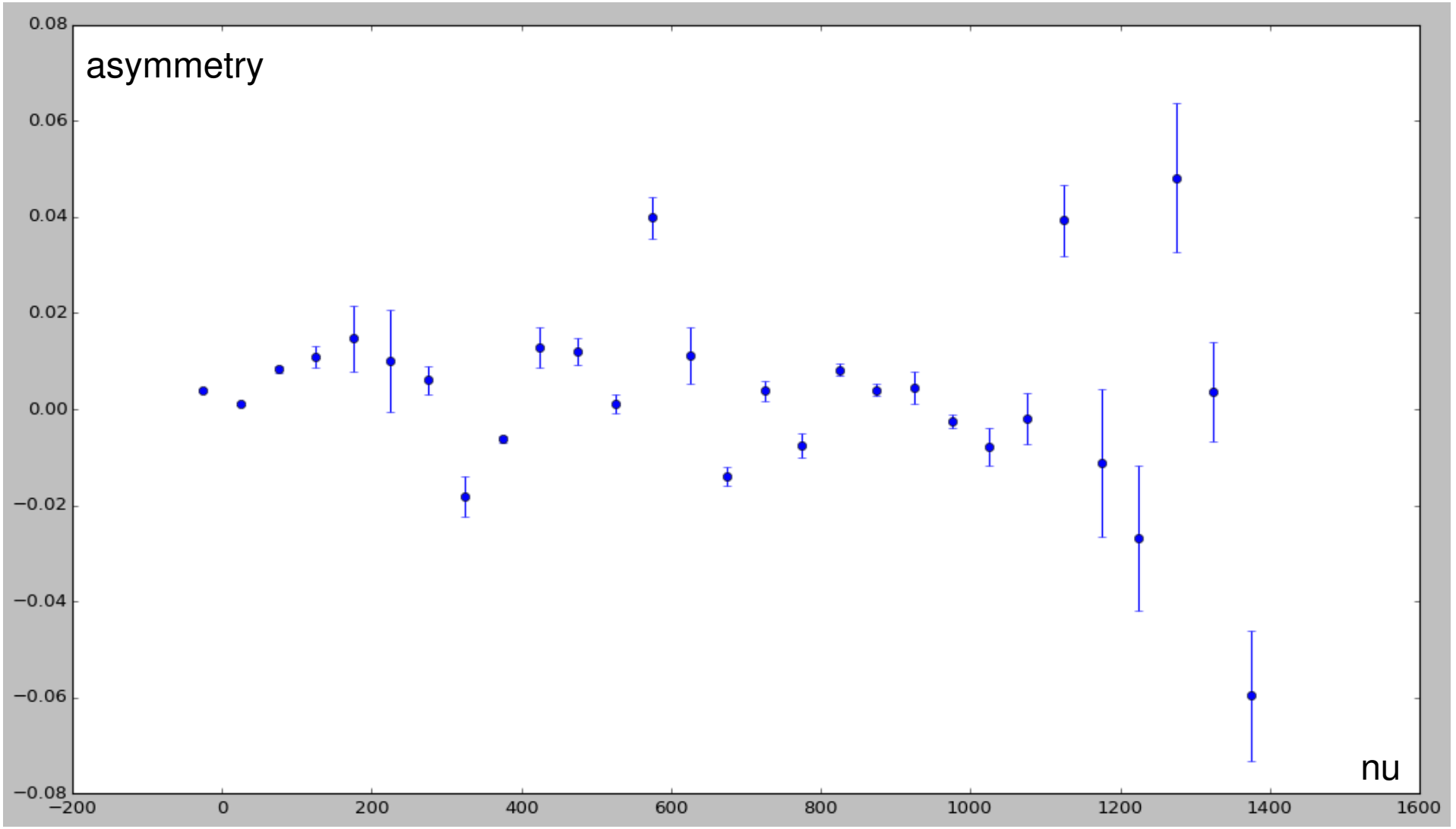


Use Toby's dilution result(didn't confirm with toby, will confirm with him later):

To Toby: Rootfile outputs at /w/halla-sfs62/g2p/pzhu/work/dilution/toby/output/2254_5T_trans,histogram name:g_dilution, ignore 1600.root



Physics asymmetry, with toby's dilution result, no acceptance cut



Acceptance cut:

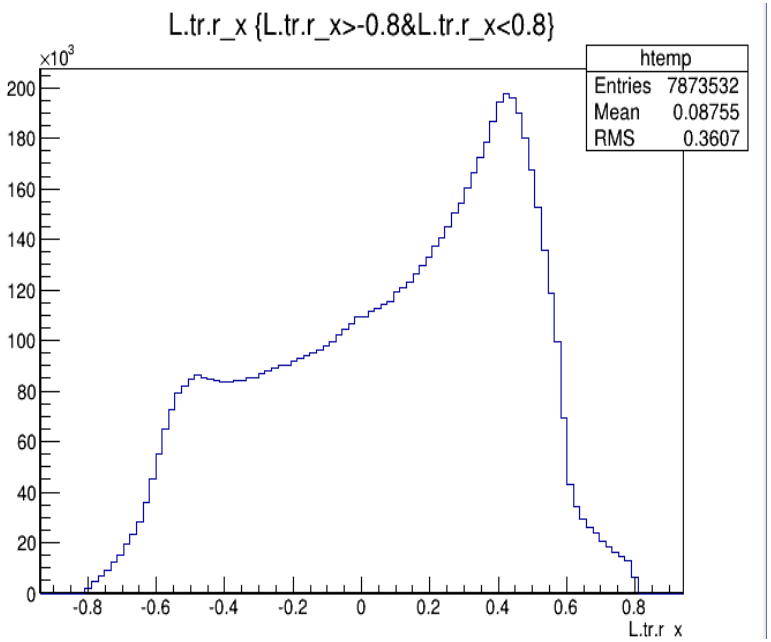
Use:

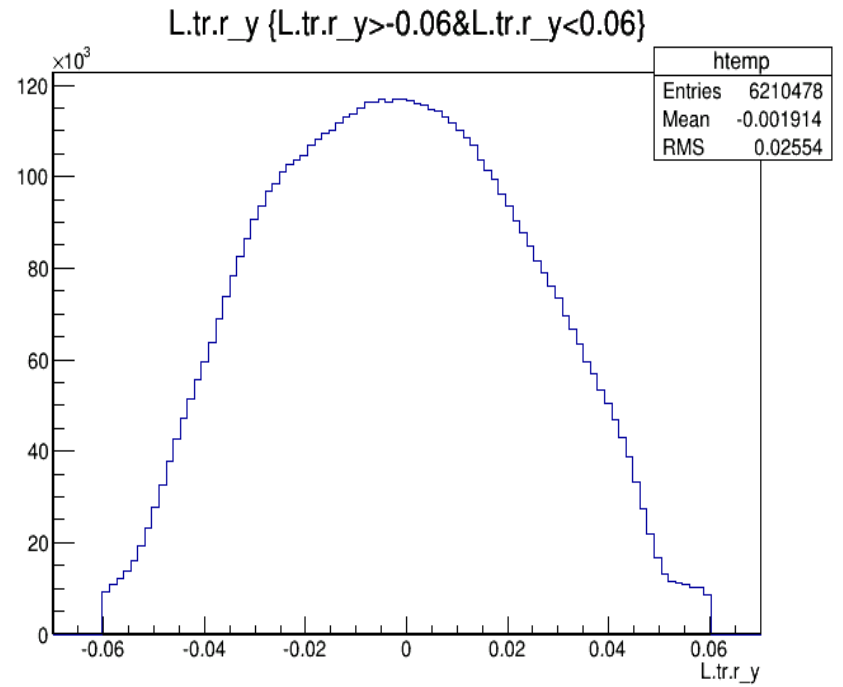
L.tr.r_x

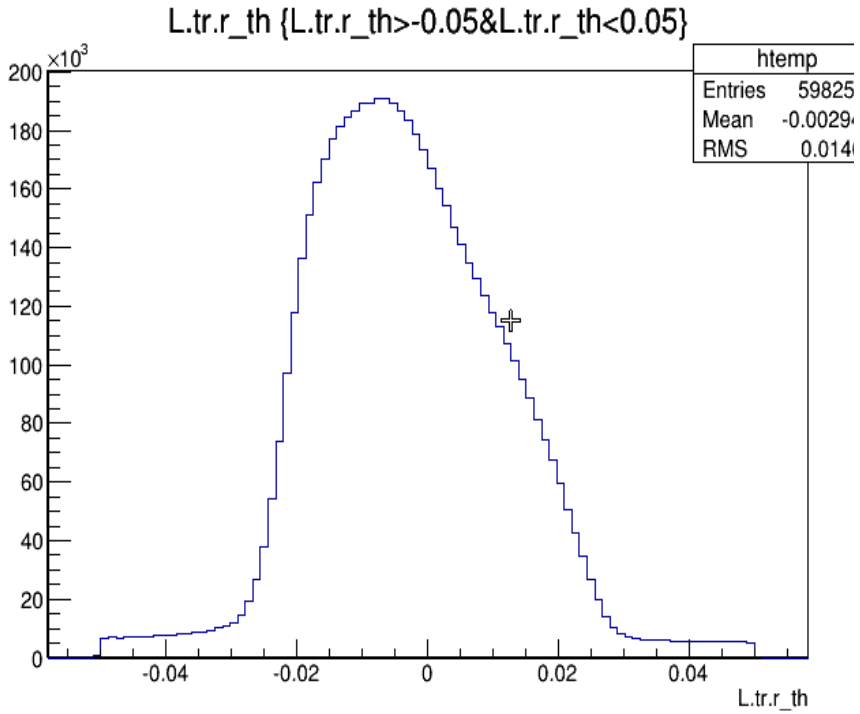
L.tr.r_x

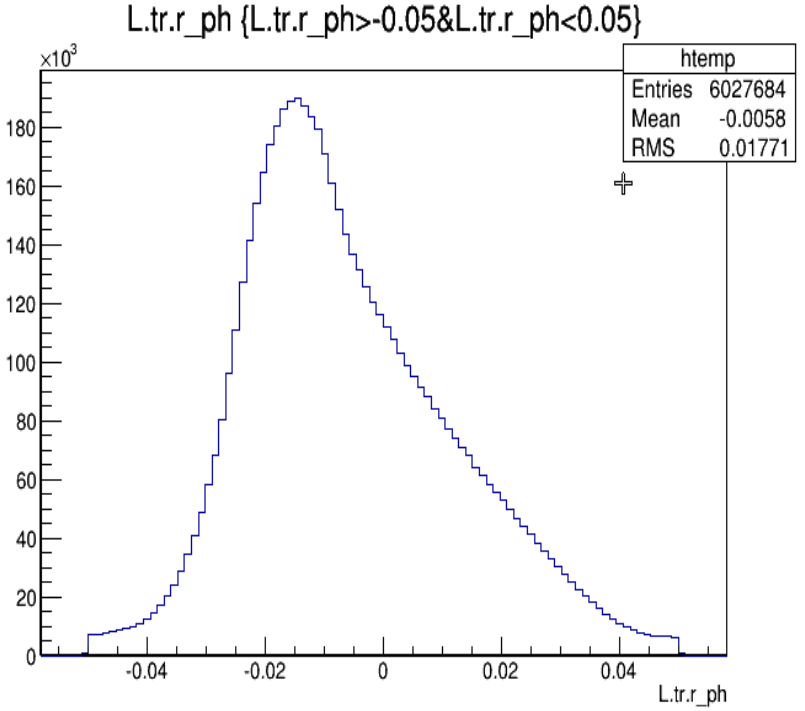
L.tr.r_th

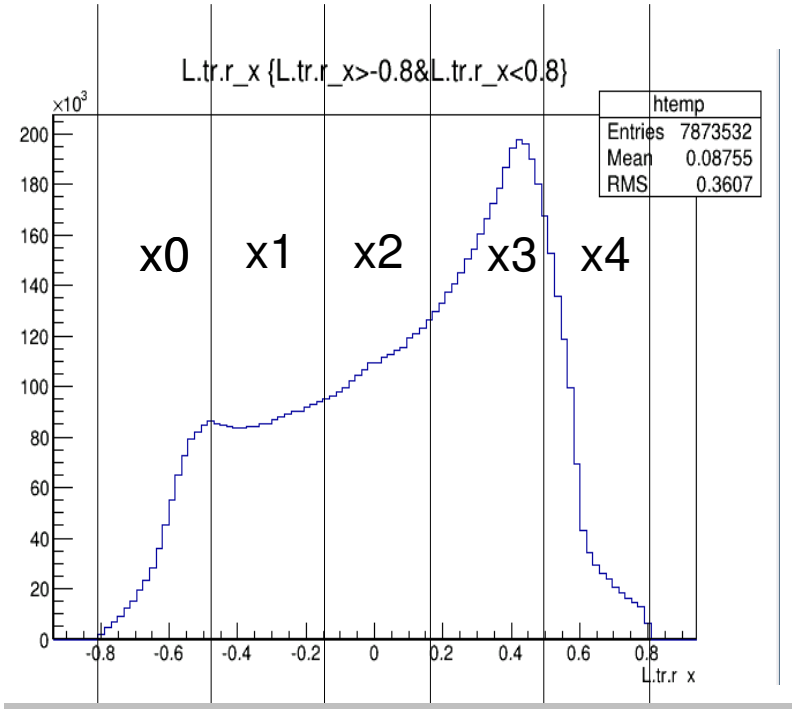
L.tr.r_ph



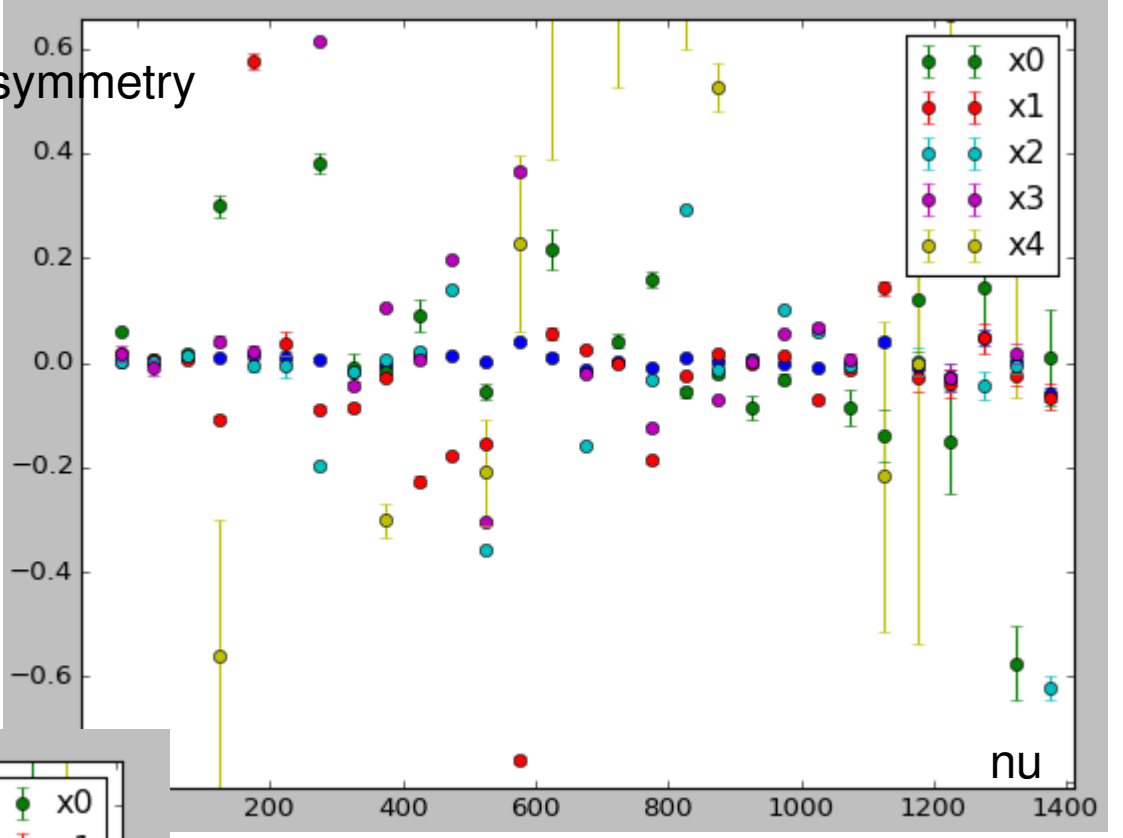


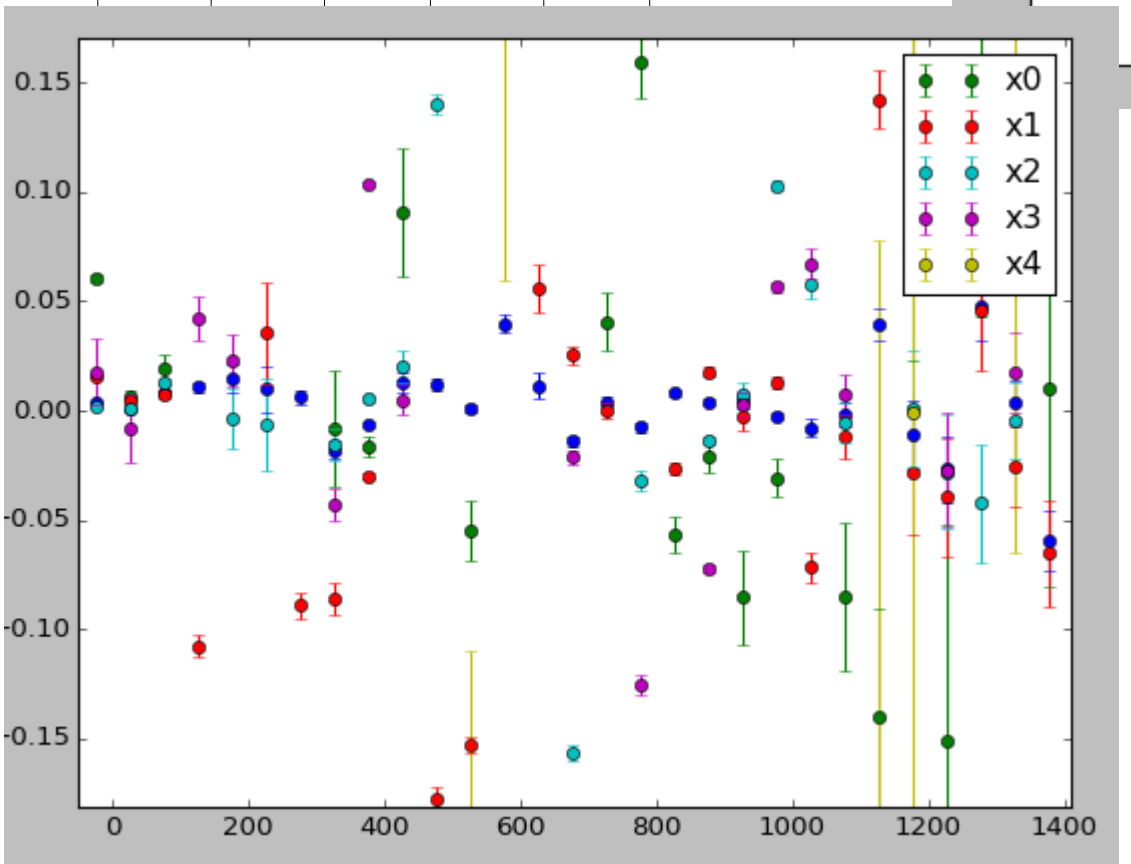




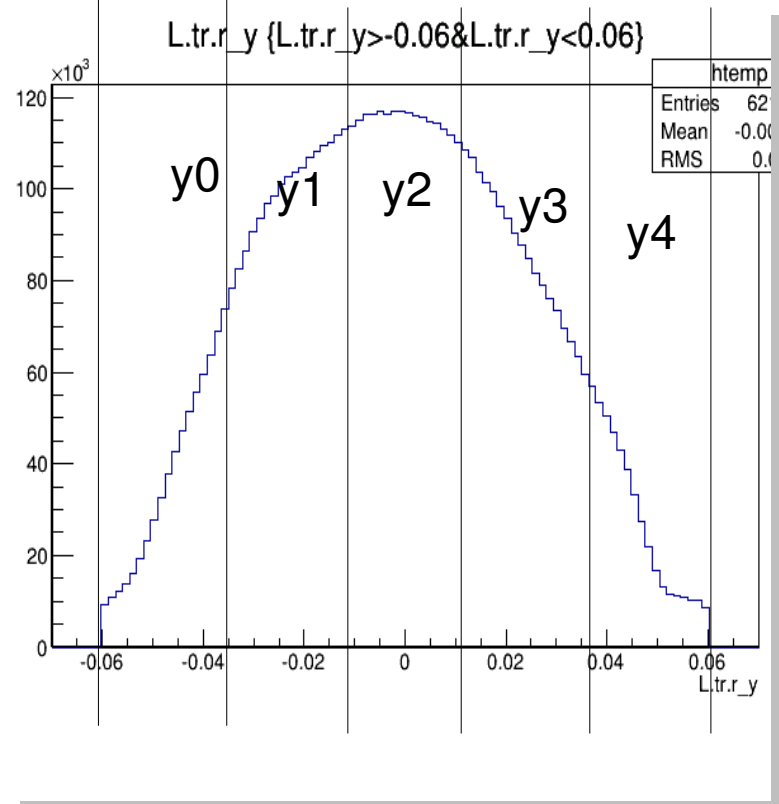


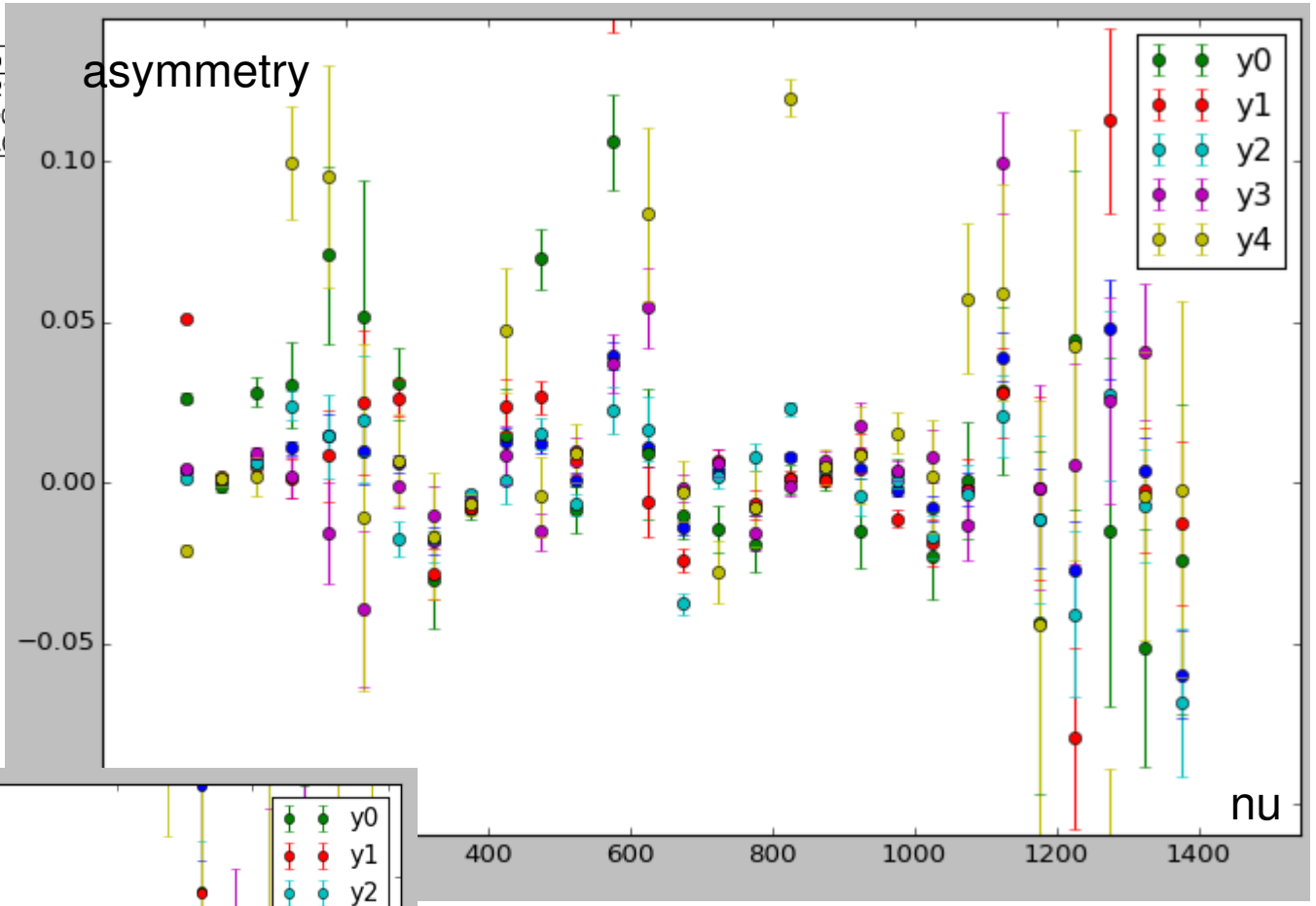
asymmetry

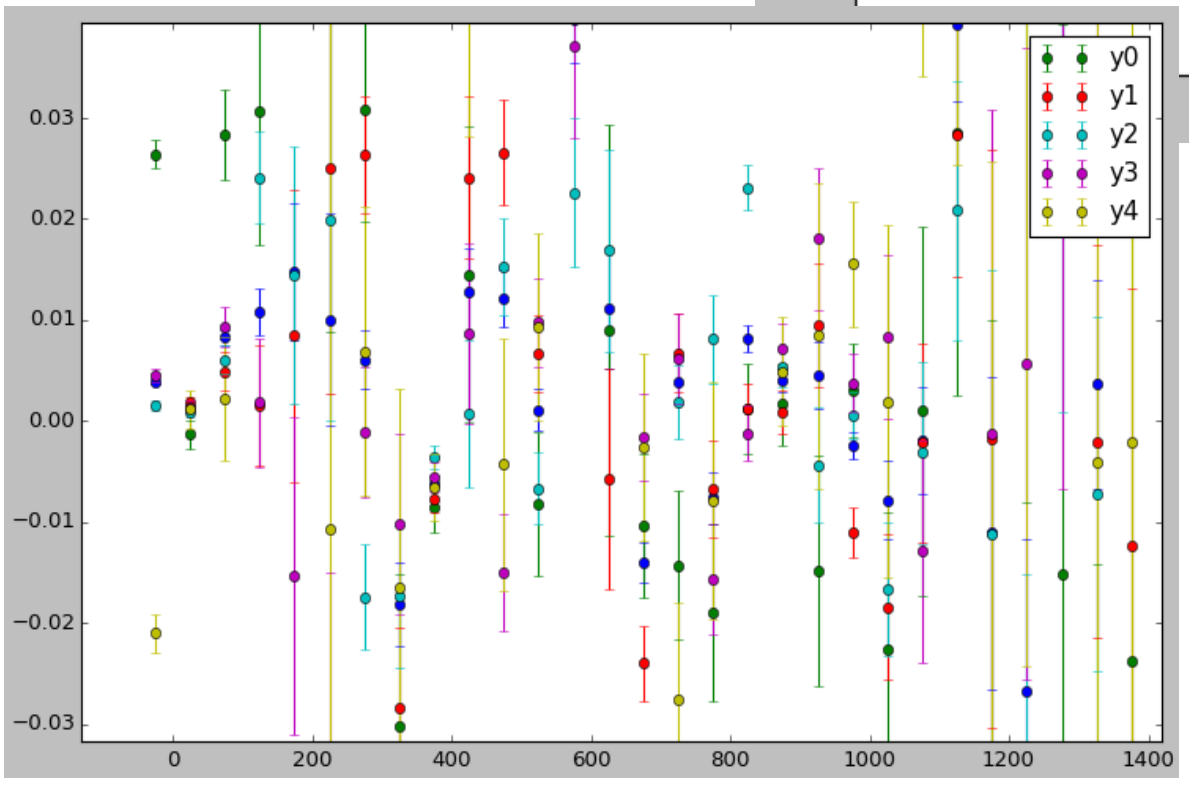




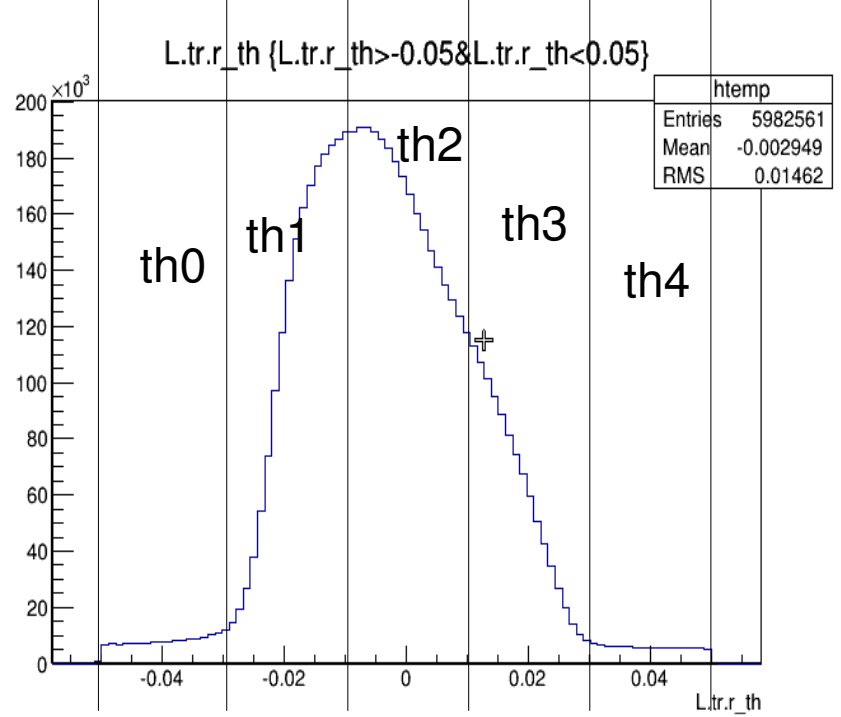
Blue: no acceptance cut

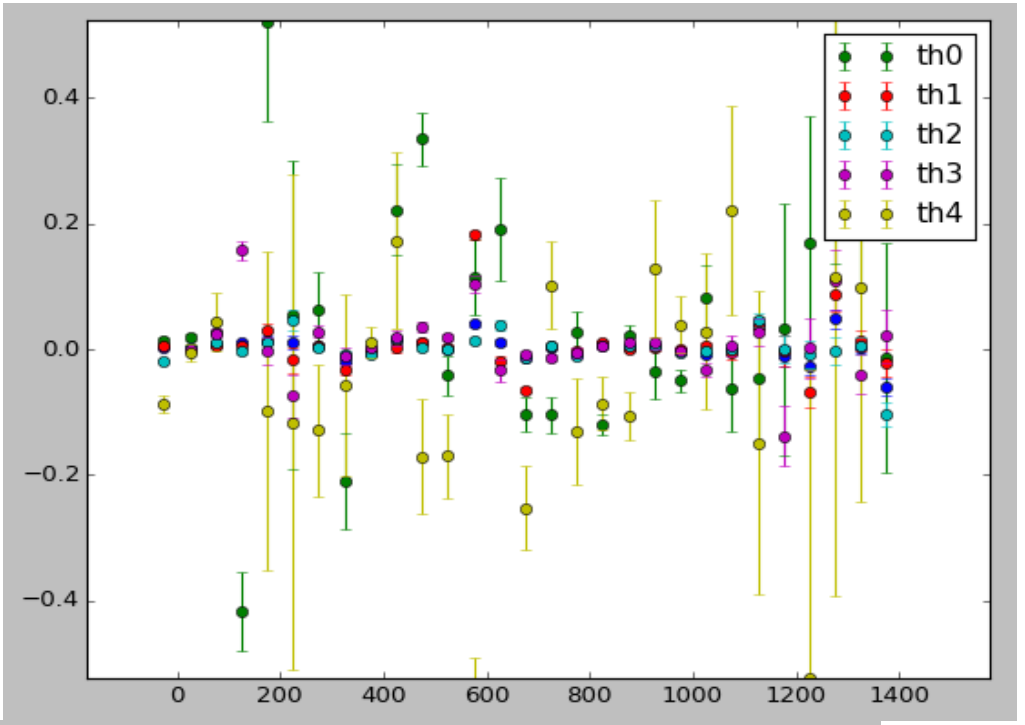


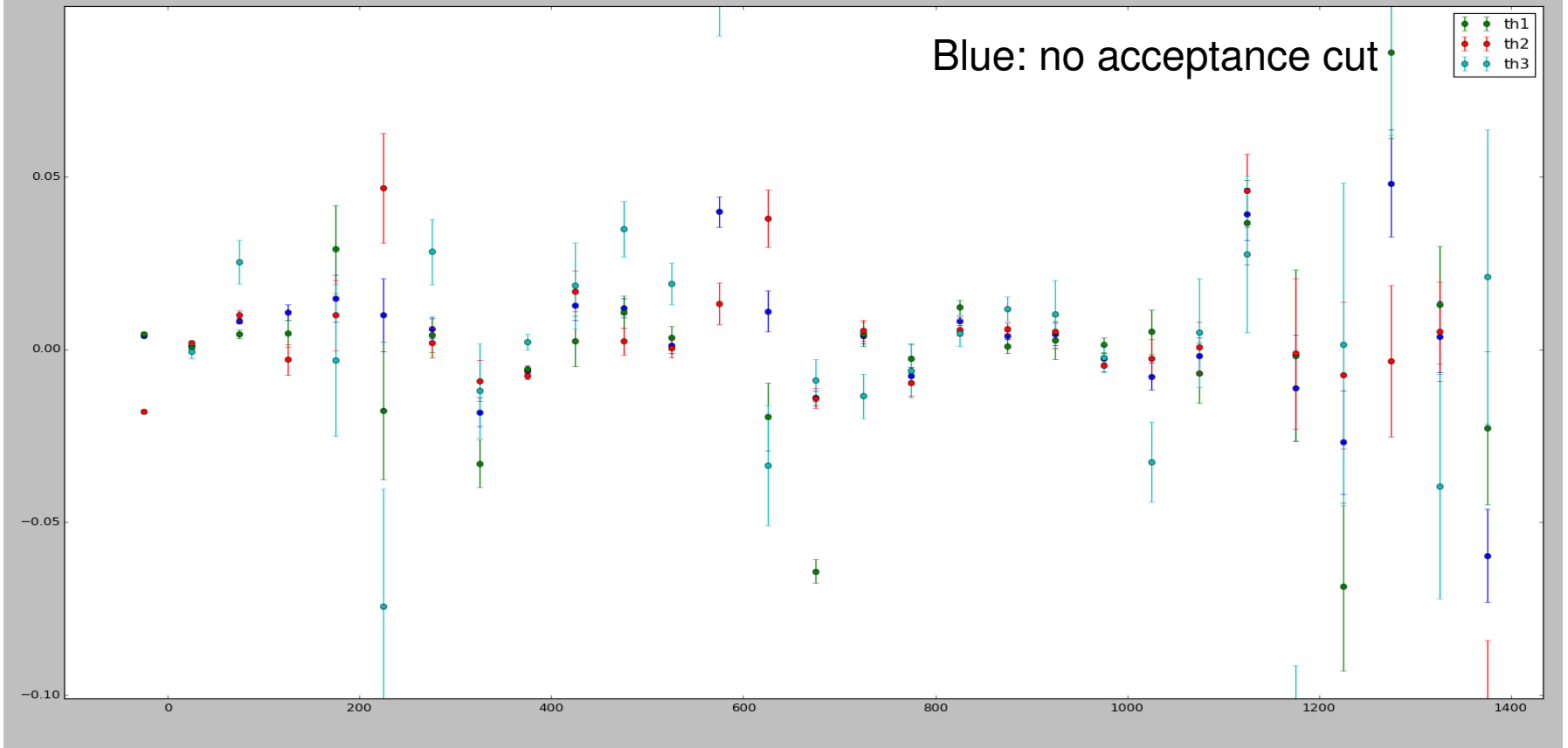


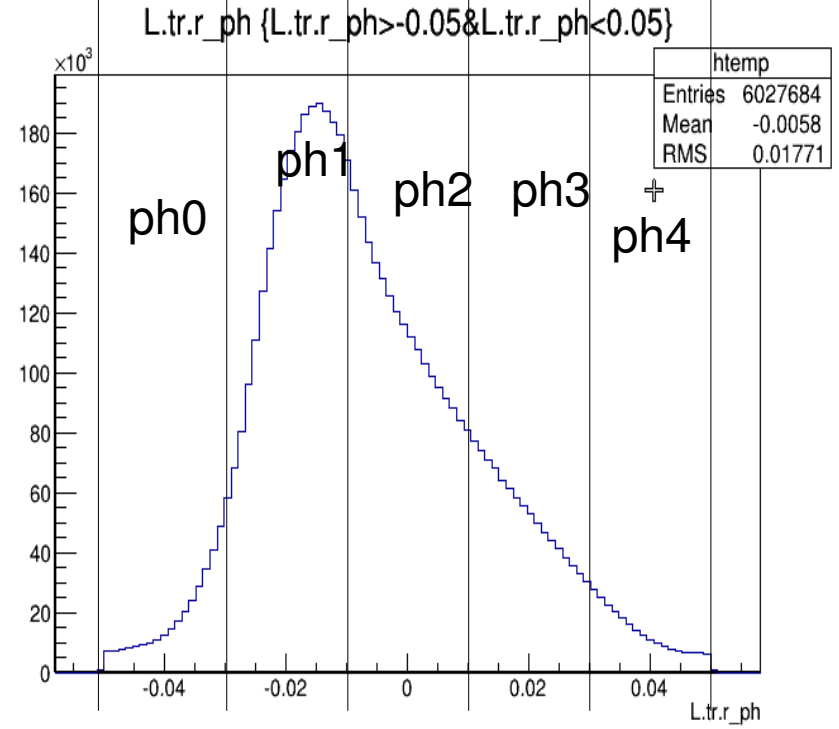


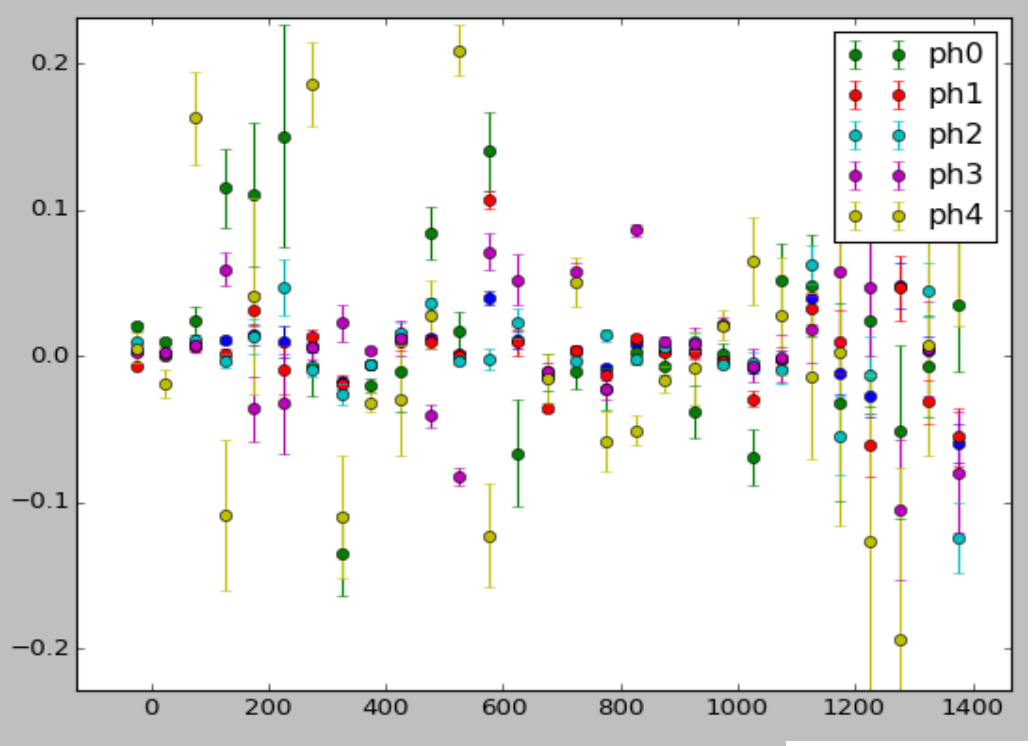
Blue: no acceptance cut

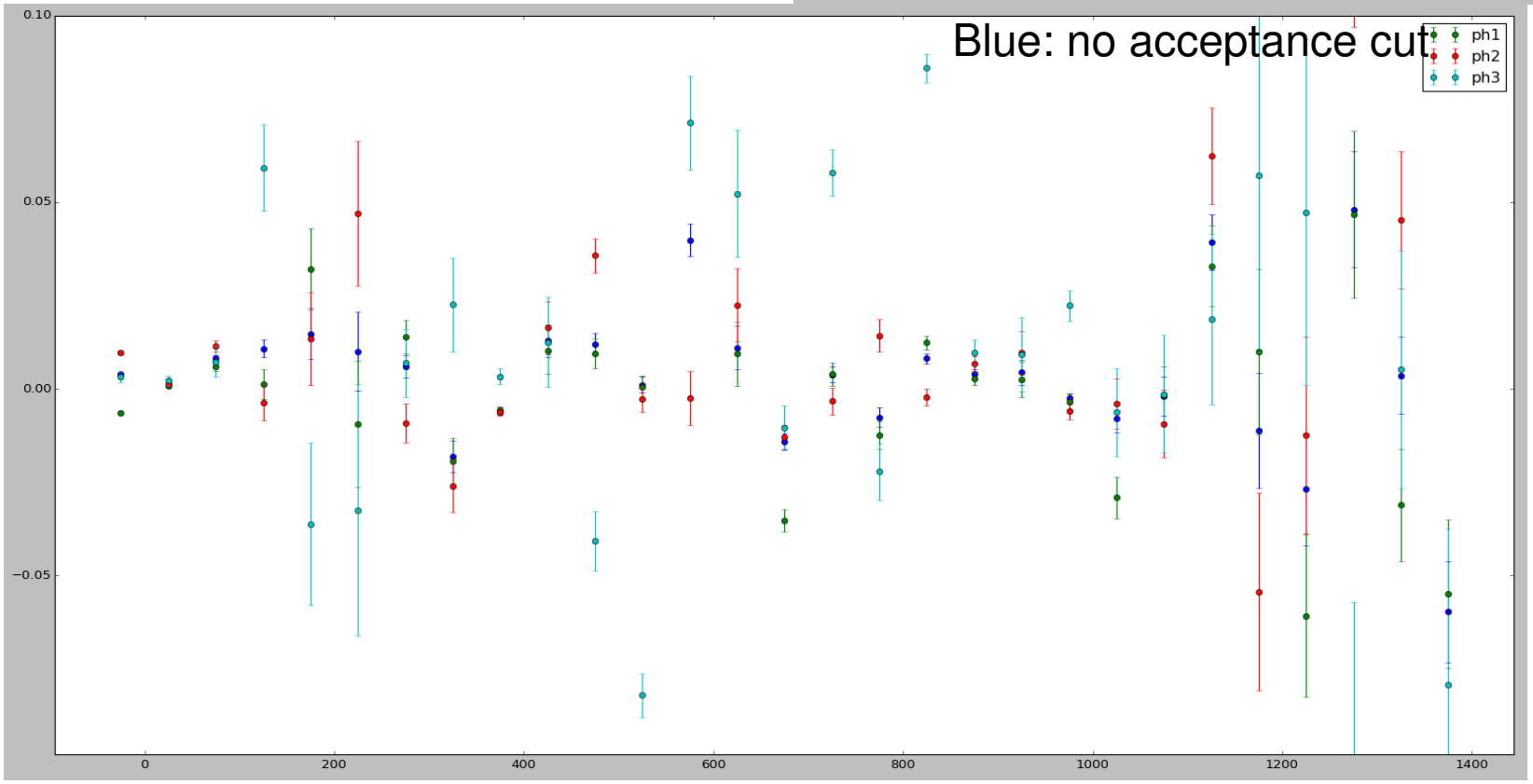

L.tr.r_th {L.tr.r_th>-0.05&L.tr.r_th<0.05}
htemp
Entries 5982561
Mean -0.002949
RMS 0.01462
th0
th1
th2
th3
th4
L.tr.r_th


th0
th1
th2
th3
th4


Blue: no acceptance cut
th1
th2
th3


L.tr.r_ph {L.tr.r_ph>-0.05&L.tr.r_ph<0.05}
htemp
Entries 6027684
Mean -0.0058
RMS 0.01771
ph0
ph1
ph2
ph3
ph4
L.tr.r_ph


ph0
ph1
ph2
ph3
ph4


Blue: no acceptance cut
ph1
ph2
ph3

Next step:

Double check with code, compare asym result with melissa/toby with dilution=1
Some correction for asymmetry with different acceptance ?

Backup

Asymmetry Calculation

$$Asym_{phys} = \frac{Y_p - Y_m}{(Y_p + Y_m) * P_b * P_t * D}$$

$$E_{asym_{phys}} = \frac{2 * Y_p * Y_m}{(Y_p + Y_m)^2 * P_b * P_t * D} * \sqrt{\frac{S_+^2}{N_+} + \frac{S_-^2}{N_-}}$$

$$S = \sqrt{1 - Lf(1 - \frac{1}{p})}$$

$L = livetime$

$p = prescale$

$$f = \frac{N_{accepted}}{N_{recorded}}$$

Runs are summed using a weighted average

$$A = \sum_i \frac{A_i/\delta A_i^2}{1/\delta A_i^2} \qquad \delta A = \sum_i \sqrt{\frac{1}{1/\delta A_i^2}}$$

See Melissa's Asym_08_21.pdf

$$\mu = HALLA\_P - 1000 * D1p * (1 + L.rec.dp)$$

Yield scale= prescale/(charge*livetime*det_eff)

Additional cut:

Trigger efficiency
Cherencov efficiency
Multi track efficiency
Pr1_cut
Cherencov sum_cut
PRDetEff

Cut data from sql database

Event type=3
Nclust=1
(Rec.dp)<0.035