More on ME-LF results

We quantified the (dis)agreement last week

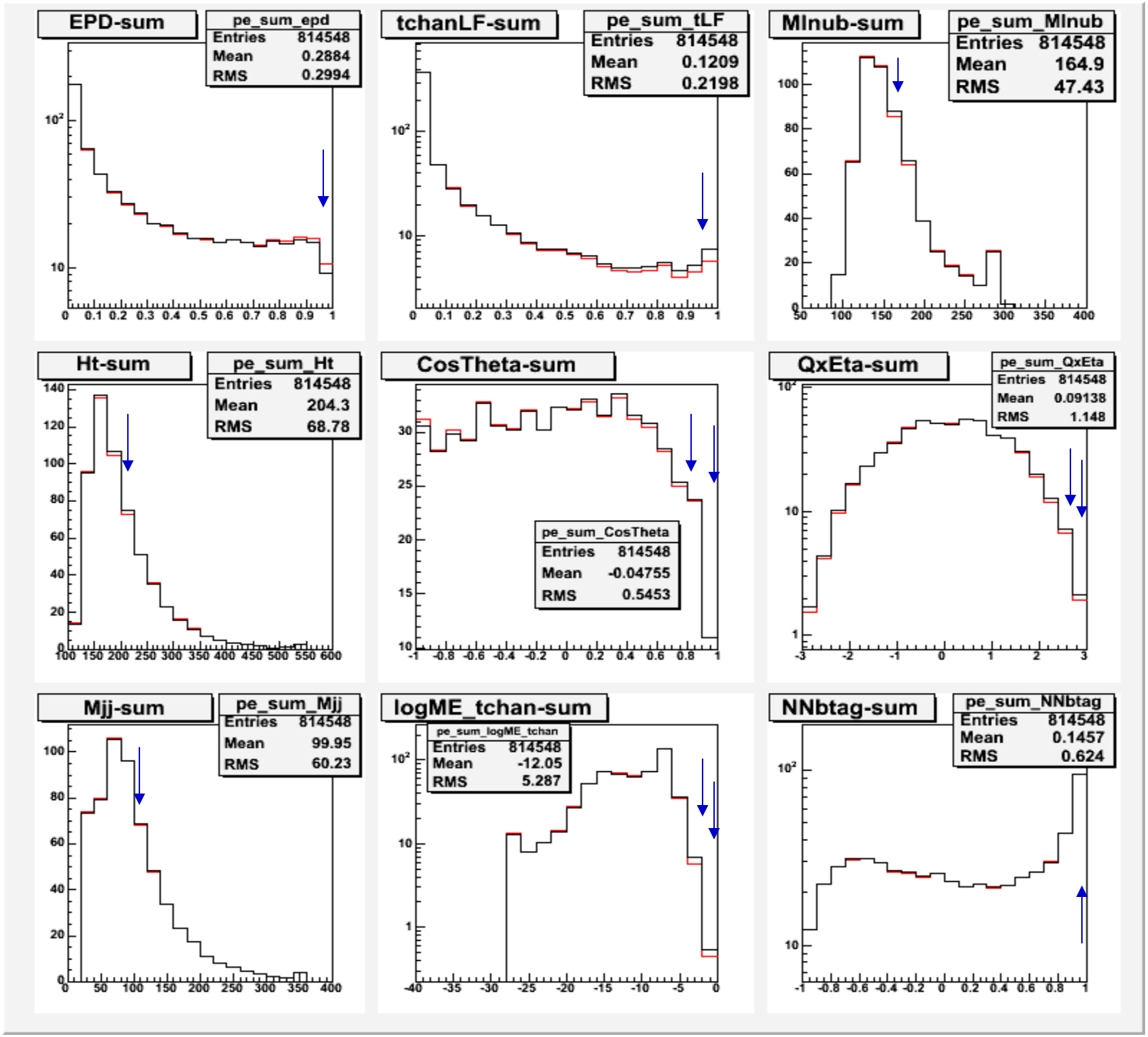
Now we address: why the (dis)agreement?

Reminder

- 10000 common ME-LF pseudo-experiments
  - A set of S+B MC events is drawn accord. to M2 predictions
  - For the set above:
    - Construct the ME distrib. Fit it against ME templ. - obtain $\beta_1 \pm e_1$
    - Construct the LFt distrib. Fit it against LFt templ. - obtain $\beta_2 \pm e_2$
  - Looking at ME fit β_1 vs LFt fit β_2 we established:
    - **13.87%** have $(\beta_1 - \beta_2) > 1\ e_1$ 1
    - **1.41%** have $(\beta_1 - \beta_2) > 2\ e_1$ 2
    - **0.05%** have $(\beta_1 - \beta_2) > 3\ e_1$ 3
    - **14.76%** have $(\beta_2 - \beta_1) > 1\ e_1$ 4
    - **2.03%** have $(\beta_2 - \beta_1) > 2\ e_1$ 5
    - **0.14%** have $(\beta_2 - \beta_1) > 3\ e_1$ 6
- Look more indepth at these pseudoexperiments.
- Did not look at the data for this study

Look at 9 variables

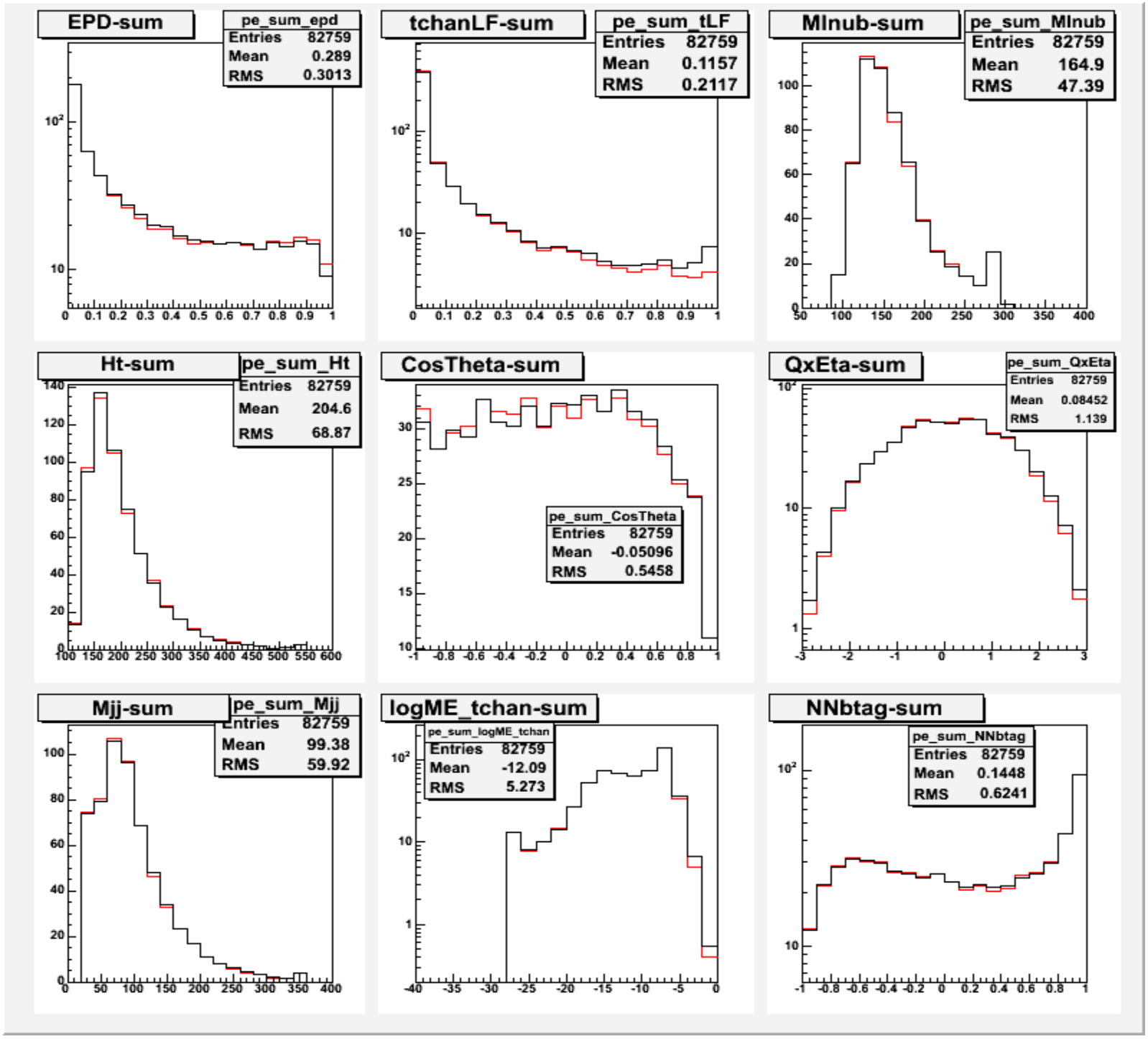
- ME epd, LF-t-chan
- Inputs to LFt-chan:
  - $M_{l\nu b}$ (with kinfit)
  - H_T
  - Qxη
  - cos(θ_{pol})
  - M_{jj}
  - log(MEt-chan)
  - ANN b-tag output



(β1 - β2) > 1 e1

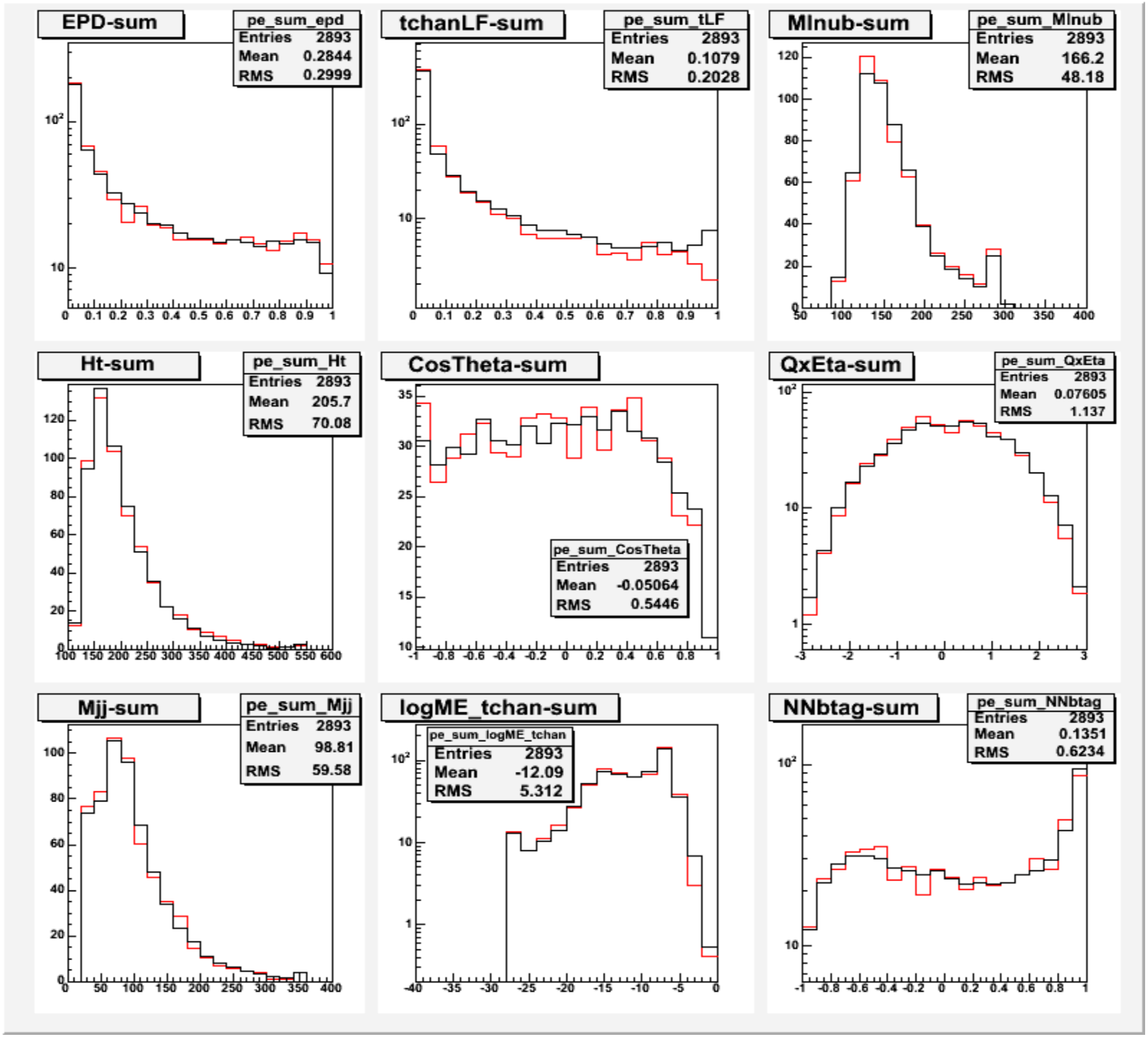
1387 pe's

Signal region



(β1 - β2) > 2 e1

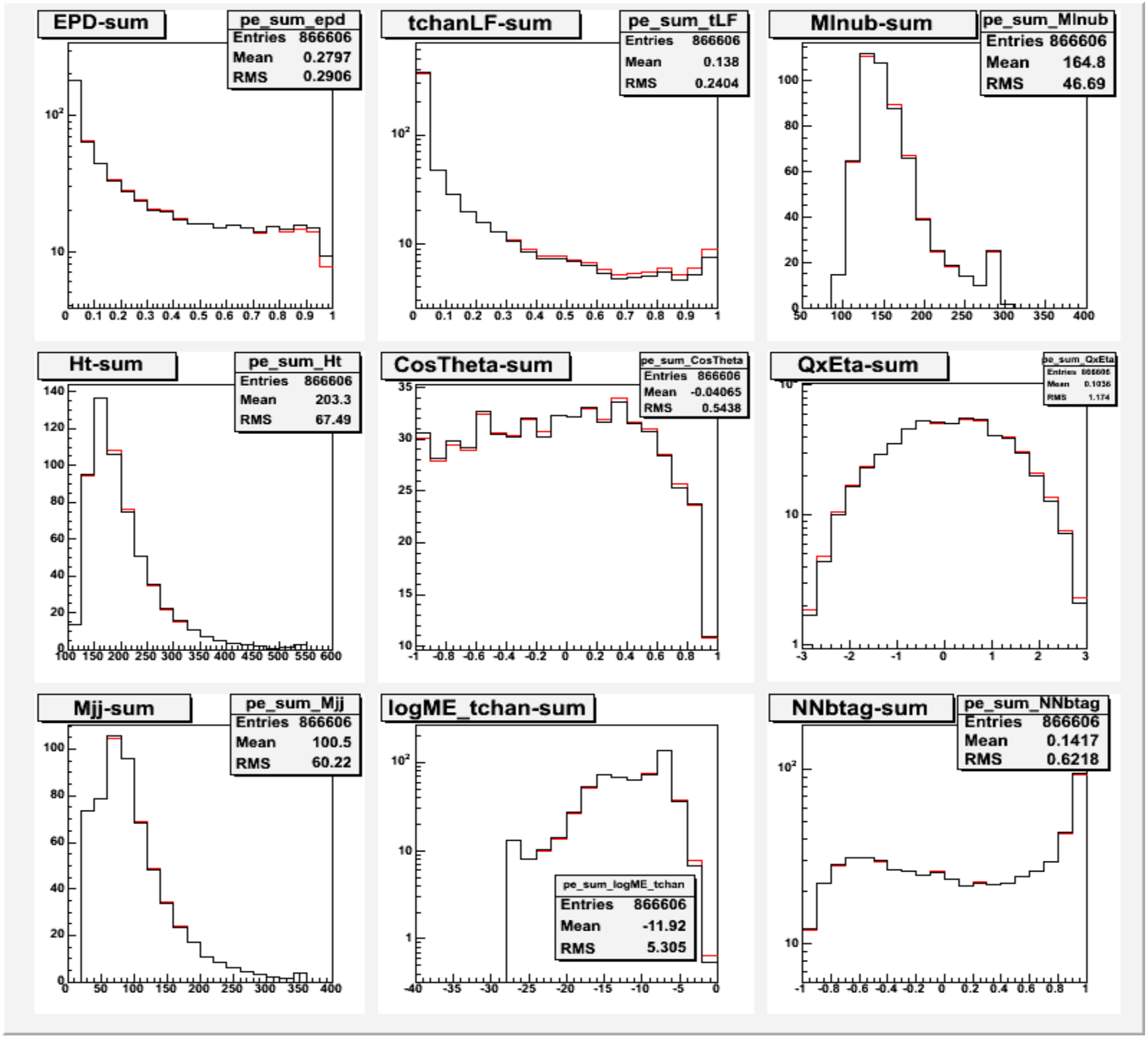
141 pe's



(β1 - β2) > 3 e1

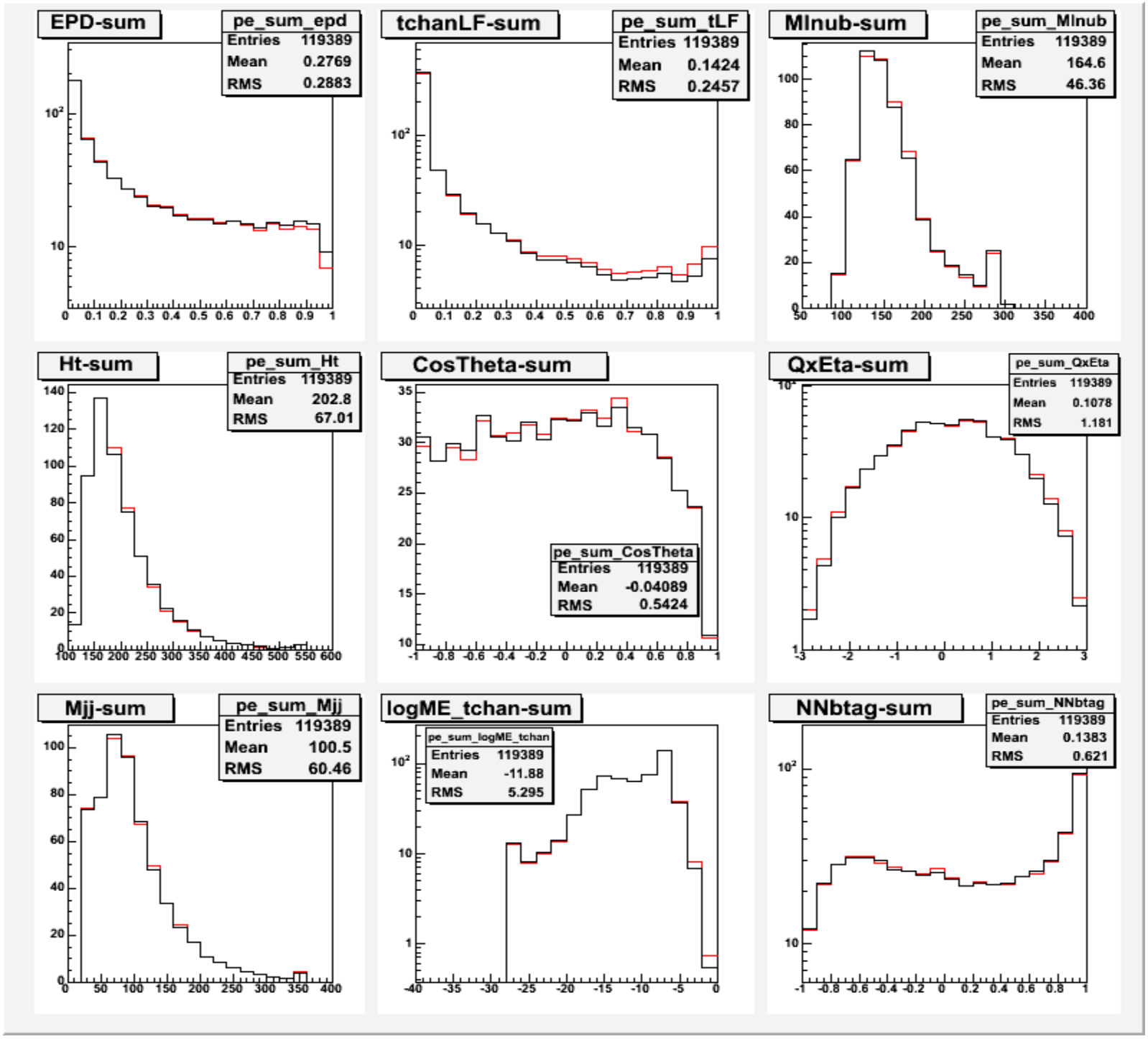
5 pe's

- What happens is that:
  - ME output fluctuates high in signal region
  - LF fluctuates low in signal region
  - The effect being the large distance between results
- Notice the obvious fact that:
  - All LF input variables exhibit the deficit:
    - log(MEt-chan), Qxη, $M_{l\nu b}$ and H_T seem have the biggest impact
- What about the other way around, ie LF>ME?



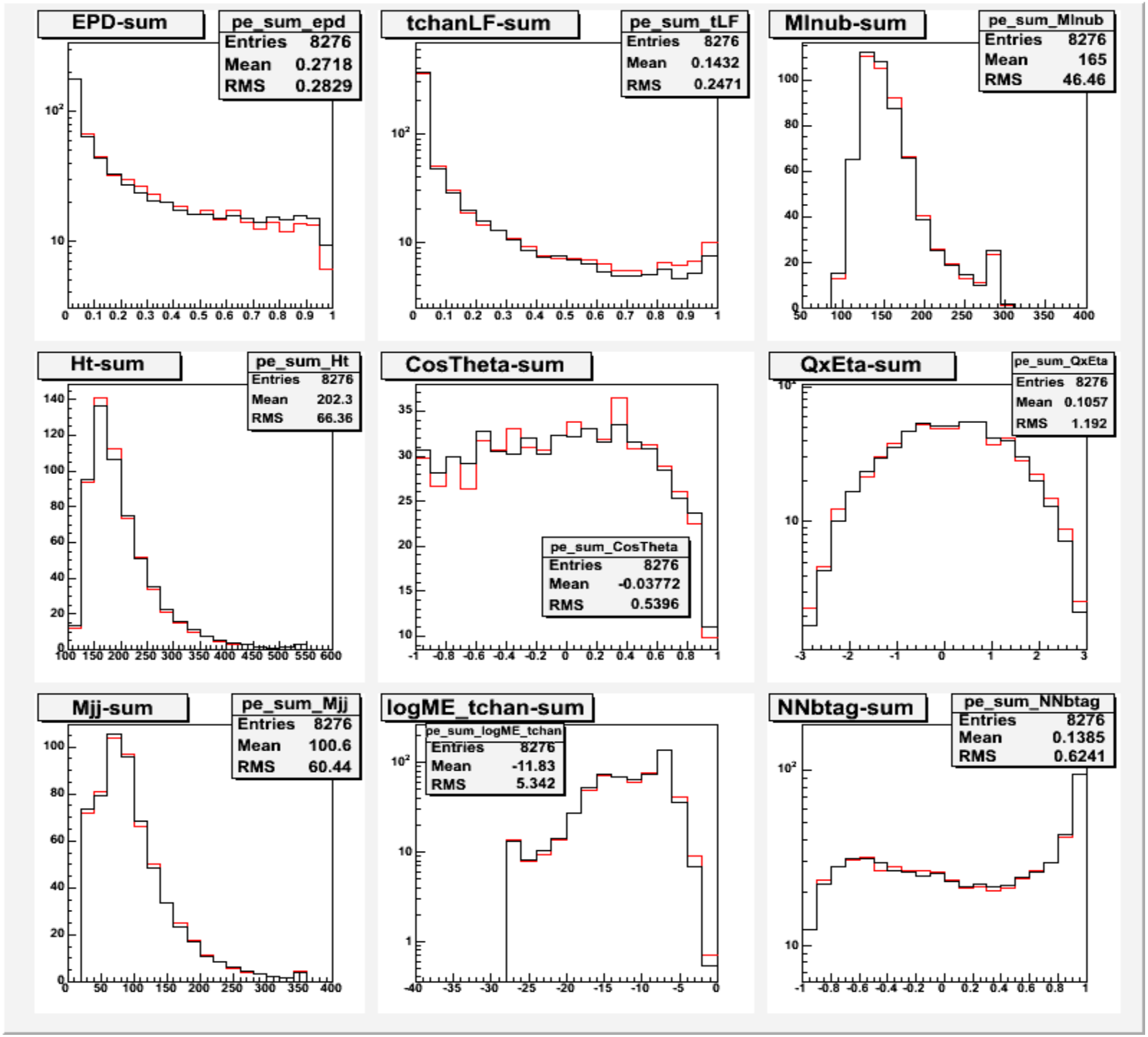
(β2 - β1) > 1 e1

1476 pe's



(β2 - β1) > 2 e1

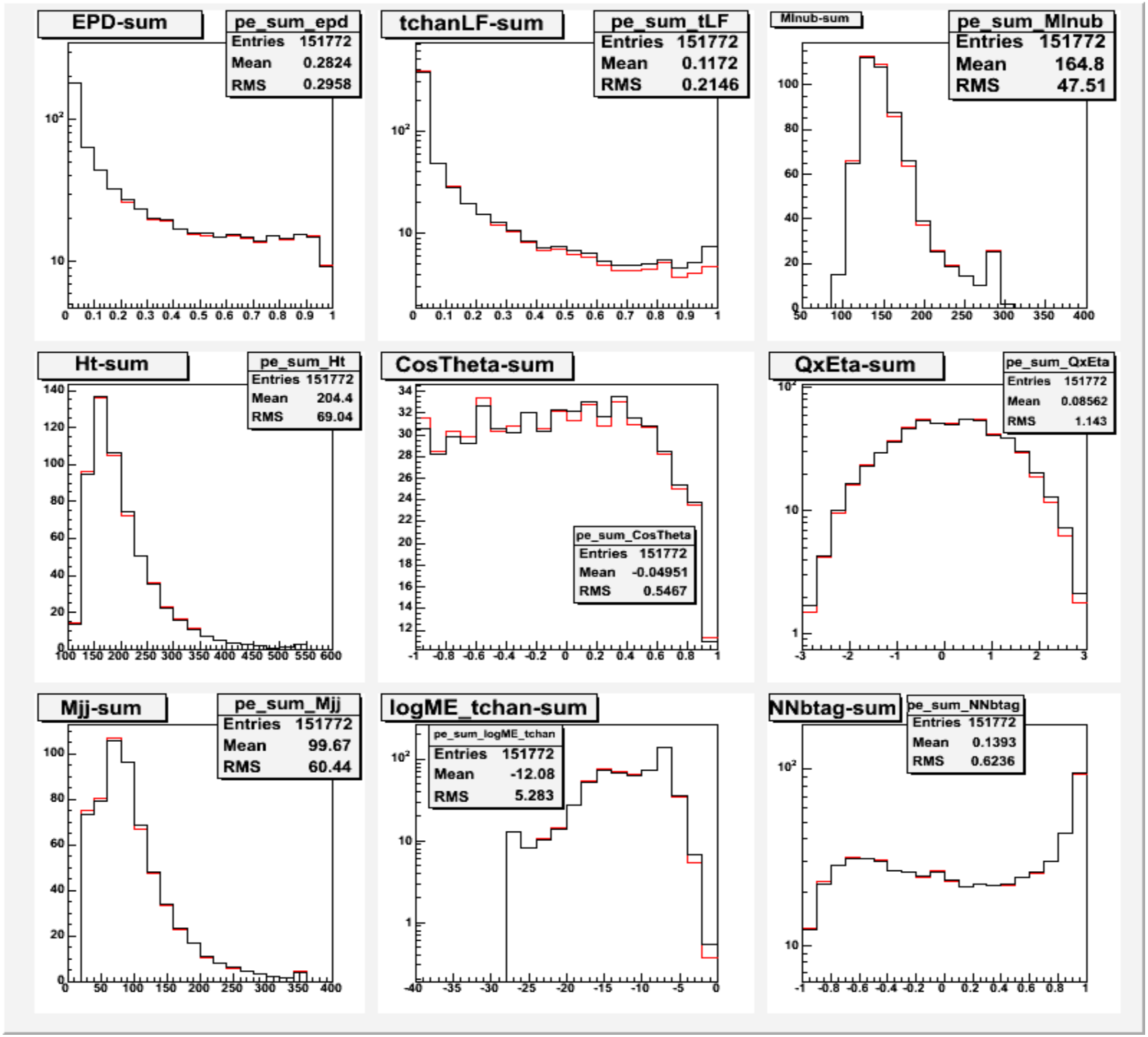
203 pe's



(β2 - β1) > 3 e1

14 pe's

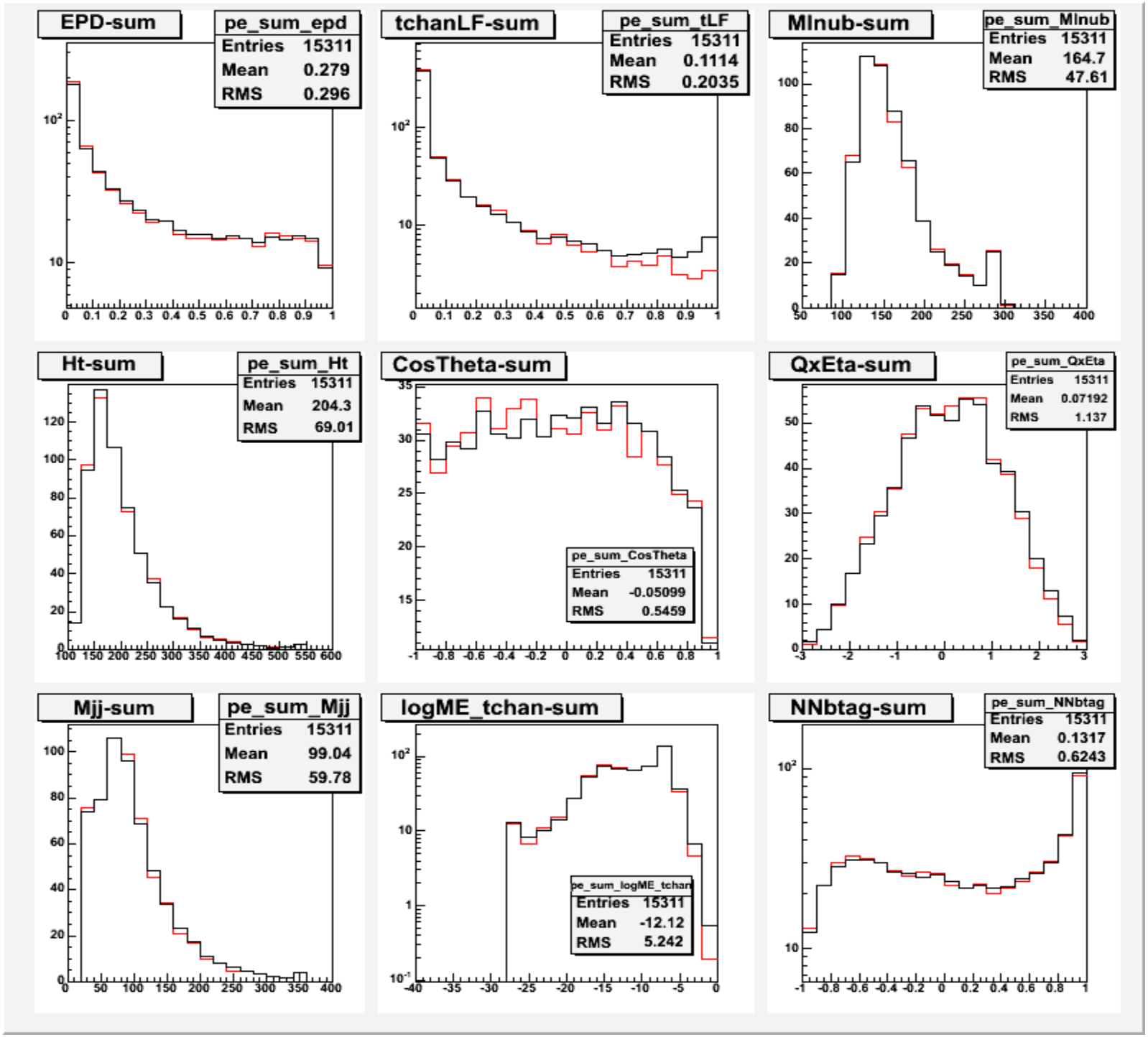
- Behaviour consistent with what we expect.
- Data motivated question:
  - What happens if we only select the subset of pseudoexp in which ME fits 1 ±0.1?



(β1 - β2) > 1 e1

0.9<β1<1.1

260 pe's

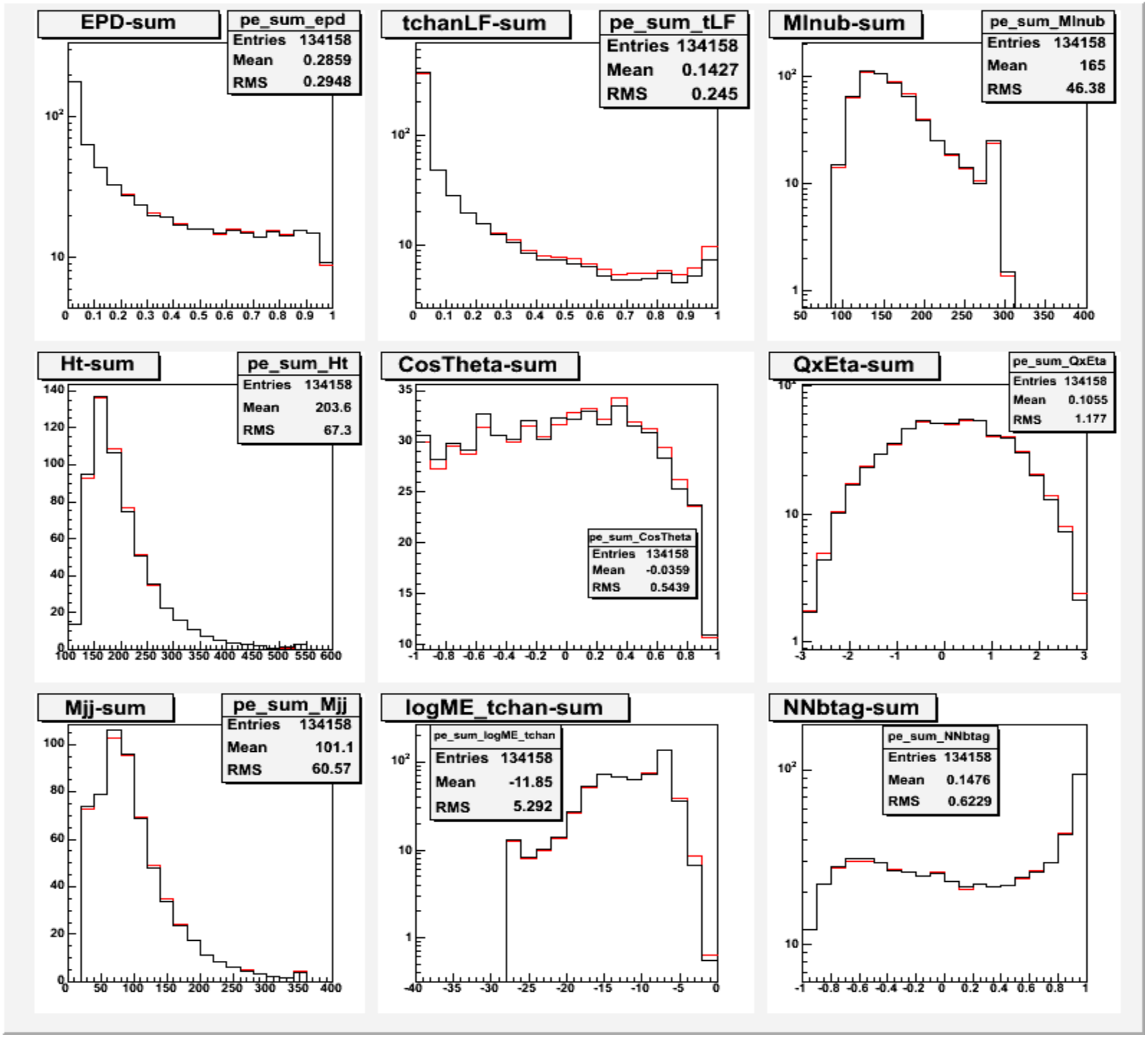


($\beta 1 - \beta 2$) > 2 e1

0.9<β1<1.1

26 pe's

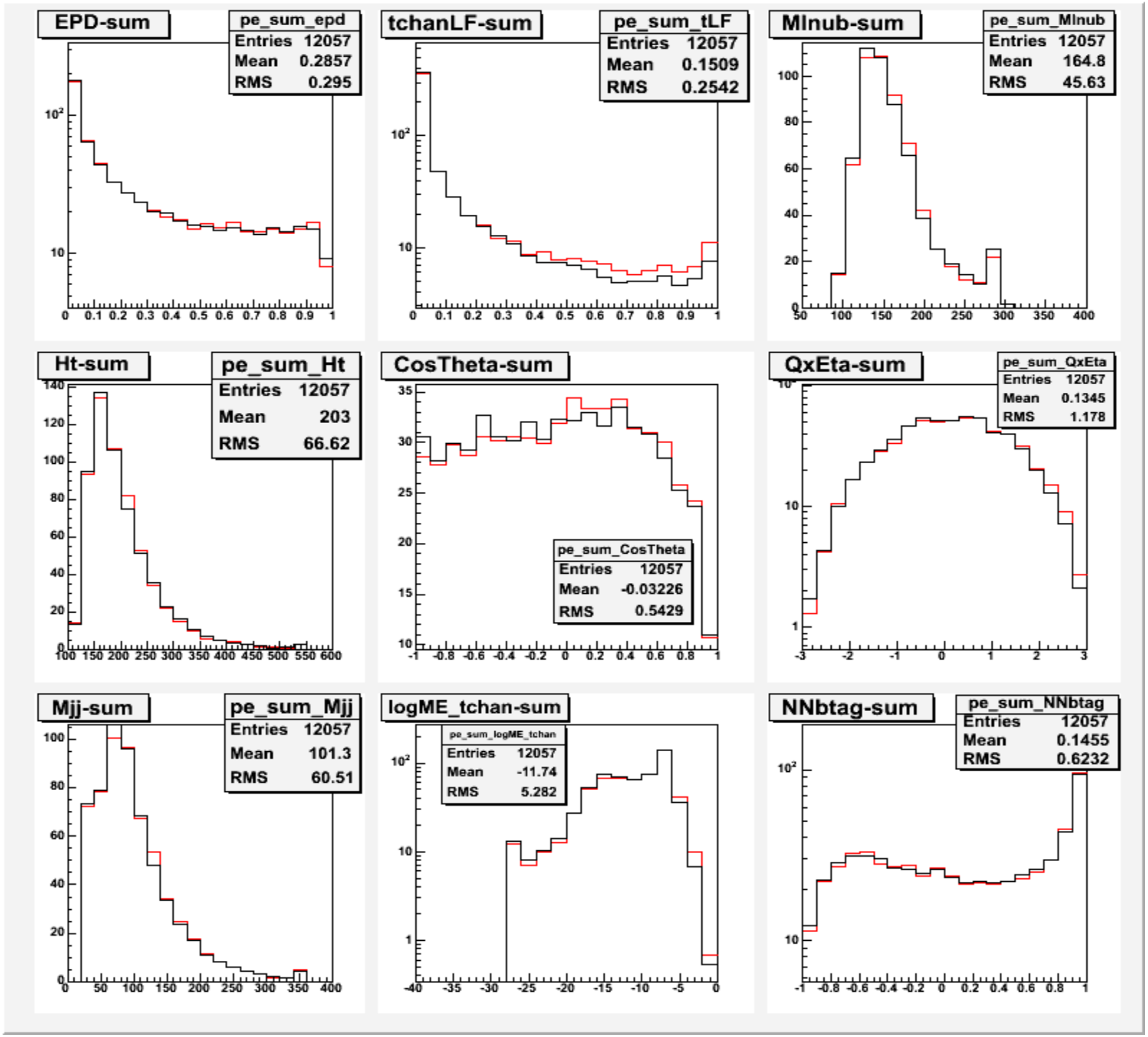
- What about the other way around: LF>ME (and still 0.9<ME<1.1)



(β2 - β1) > 1 e1

0.9<β1<1.1

227 pe's



($\beta 2 - \beta 1$) > 2 e1

$0.9 < \beta 1 < 1.1$

20 pe's

Conclusions

- For the data-motivated checks (0.9>β1>1.1), there is a faint correlation between the ME epd and Mjj , cosθ variations.
- Feel free to speculate why this is.
- Bottom line:
  - Pseudoexperiments happen
  - For DPF purposes, maybe Bernd could have slide 13 as backup.
  - Another 2 slides on compatibility would show:
    - Fit1 vs fit 2 in p-e. Bernd could talk the public through Charles' reasoning. This slide would also contain the percentages of times Nsigma happens. Or Tom's chisquares – whatever your favorite way of conveying 5% is.
    - Pval1 vs pval2 slide with a reference to NN ana + combination coming up