Over-constraint Problem

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MaQE Posterior

prefit $\sigma = 1$

FD-Only

PDF
$\mu = -0.04$, $\sigma = 0.75$

Gauss
$\mu = -0.02$, $\sigma = 0.75$

HPD
$\mu = 0.09$, $\sigma = 0.77$ ($+0.84-0.71$)

Input
$x = 0.00$

FD + ND

PDF
$\mu = -0.00$, $\sigma = 8.44e-05$

Gauss
$\mu = -0.00$, $\sigma = 7.41e-05$

HPD
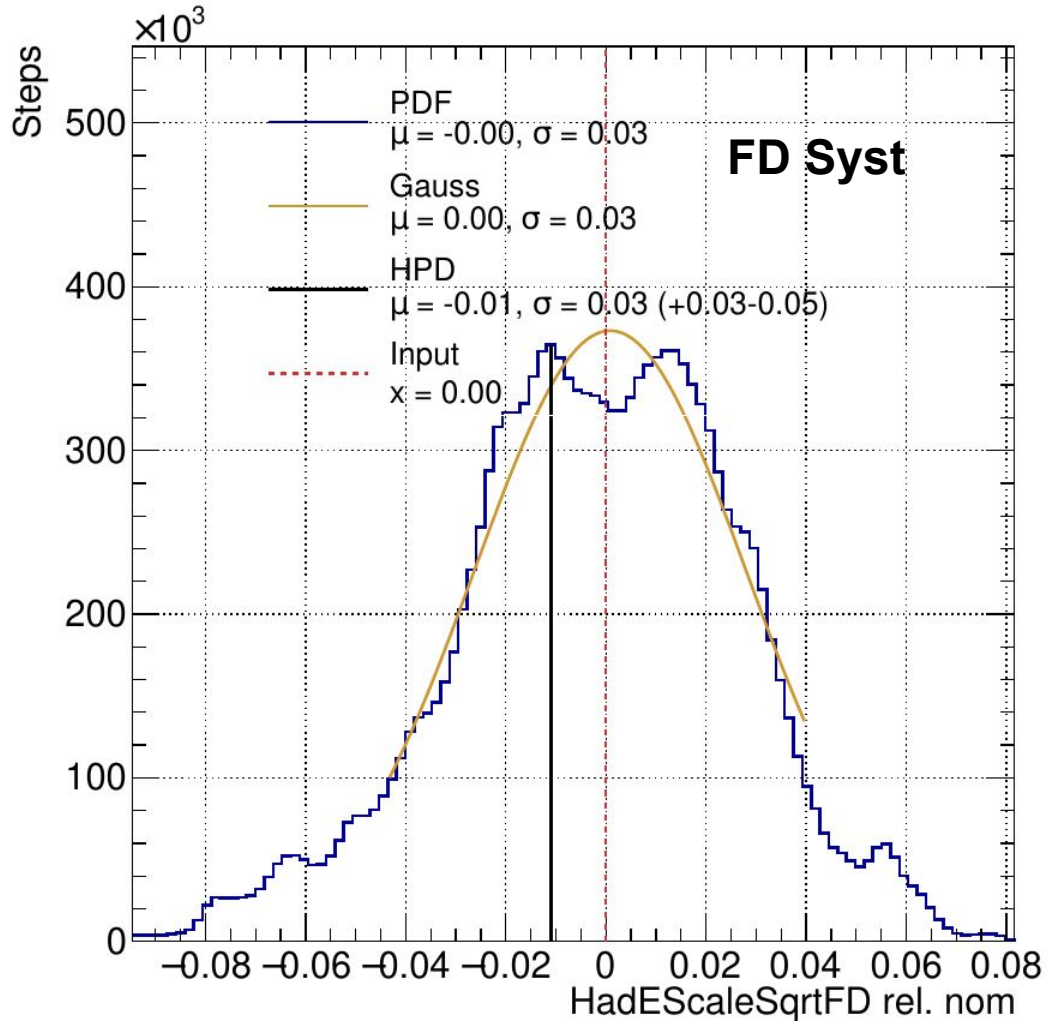$\mu = -0.00$, $\sigma = 8.58e-05$ ($+9.59e-05-7.57e-05$)

Input
$x = 0.00$
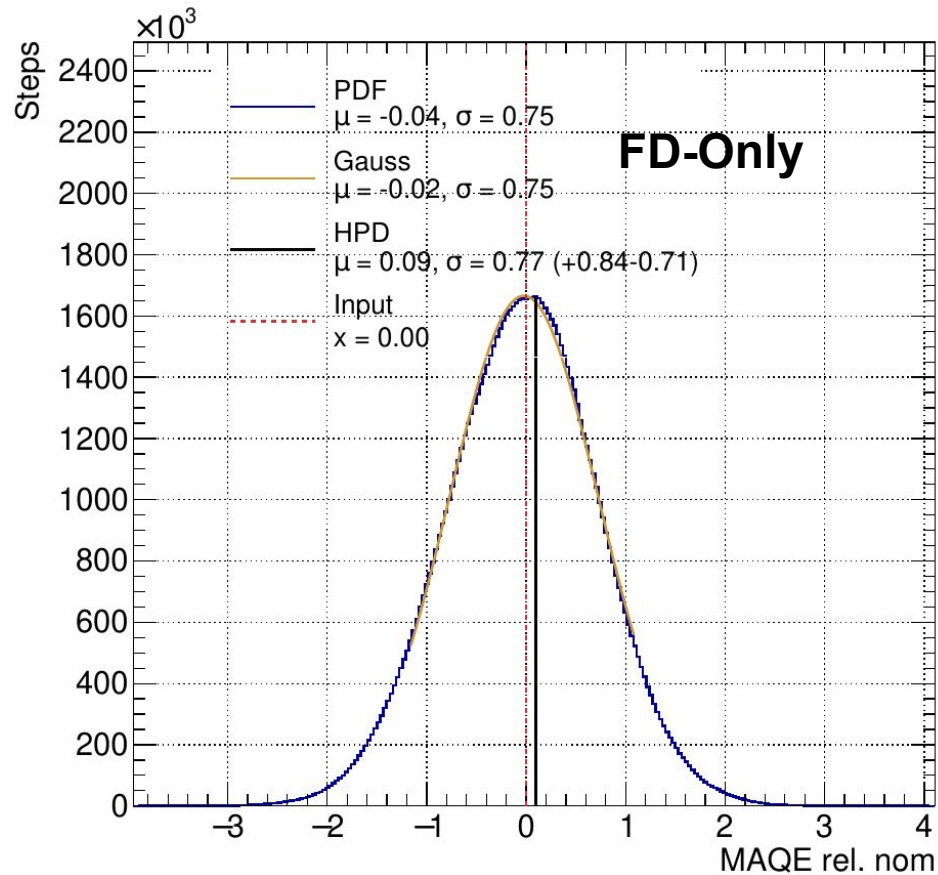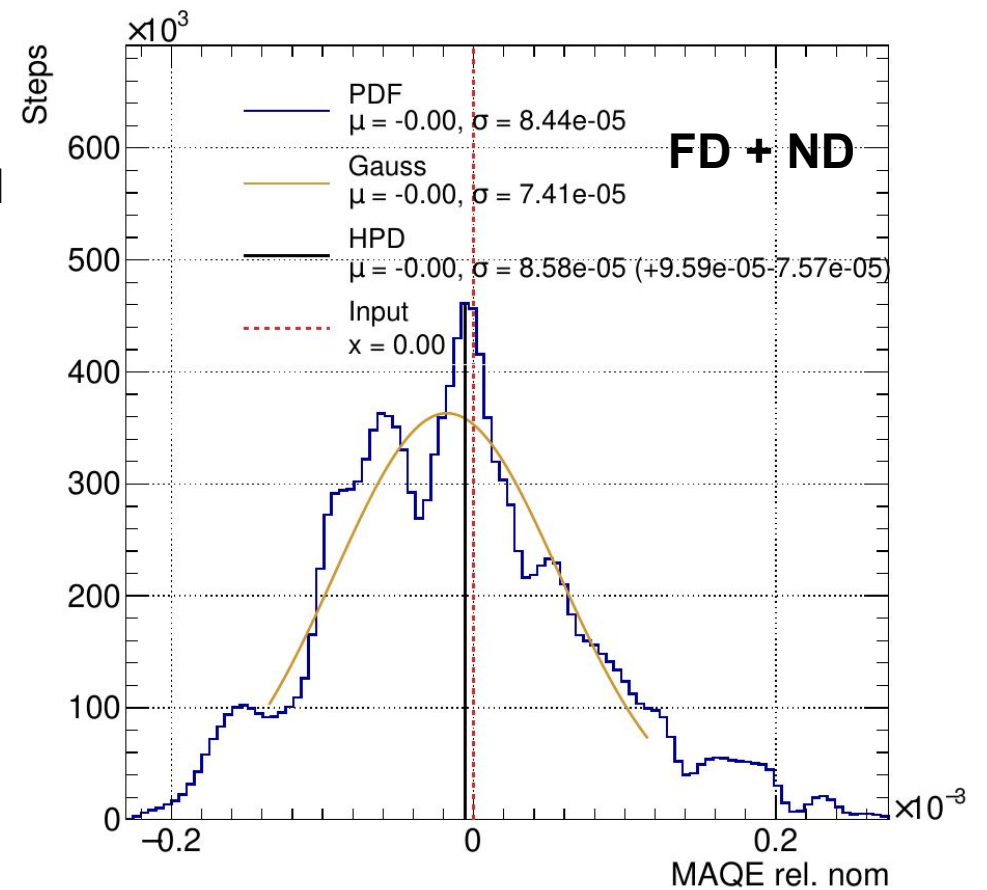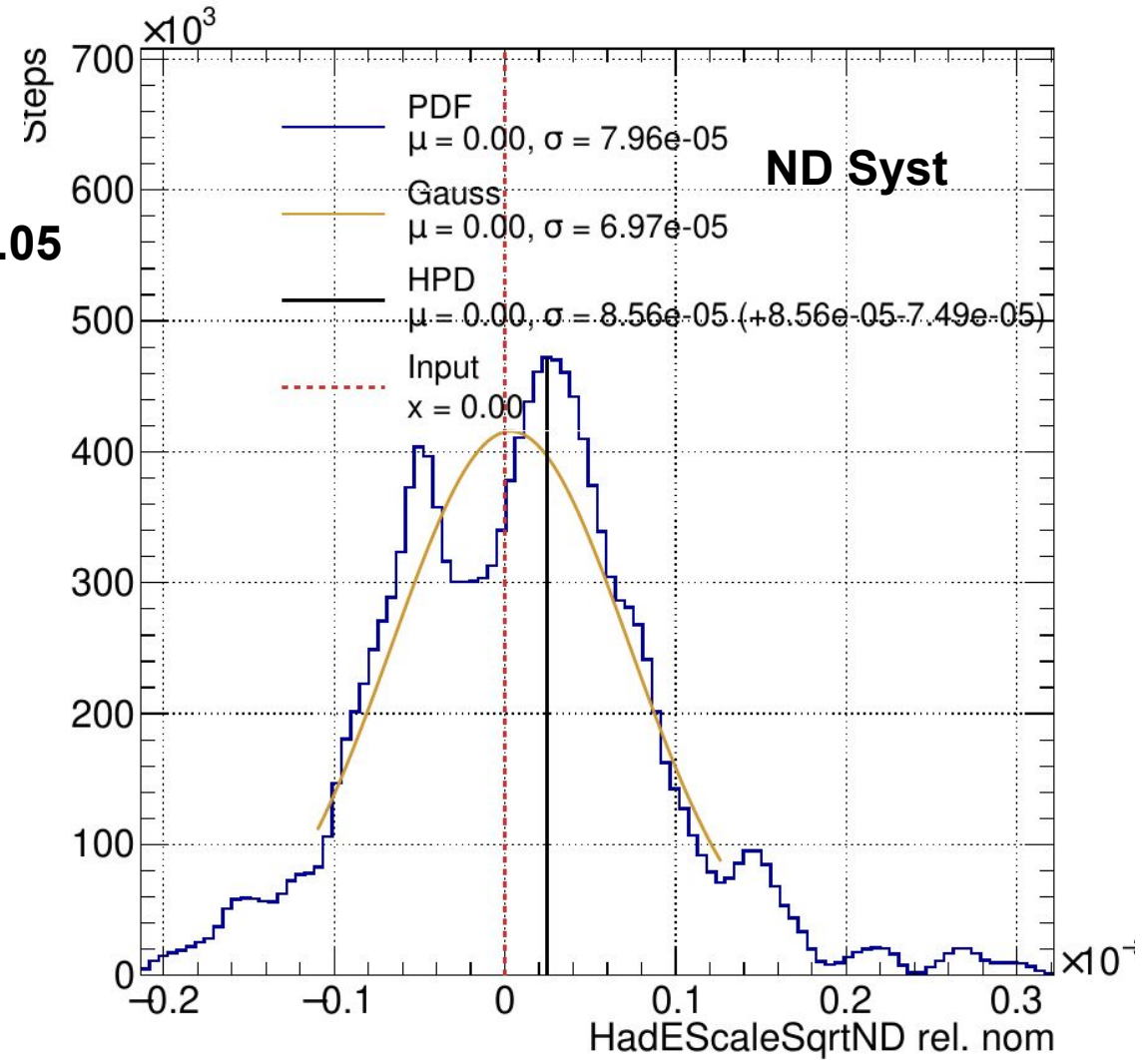
- Posterior/Prior **~0.0001** upon addition of ND samples

- Irregular shape due to bad-mixing

Detector Systematic Posterior

FD Syst

PDF
μ = -0.00, σ = 0.03

Gauss
μ = 0.00, σ = 0.03

HPD
μ = -0.01, σ = 0.03 (+0.03-0.05)

Input
x = 0.00

prefit σ = 0.05

ND Syst

PDF
μ = 0.00, σ = 7.96e-05

Gauss
μ = 0.00, σ = 6.97e-05

HPD
μ = 0.00, σ = 8.56e-05 (+8.56e-05-7.49e-05)

Input
x = 0.00

Thoughts/Plans

- TDR analysis fixed issue by creating covariance matrix from ND detector systematics
  - We could try something similar
  - How did this have an effect on constraint on MaQE?

- Tried fitting to asimov data + poisson throw in each bin
  - Basically did nothing - stat error is far too small
  - Converged to higher LogL but posteriors widths are unchanged

- New idea - don't fix it…
  - Perform fits which show where model is lacking
  - **Add duplicate MaQE systematic at ND only**
  - Show degeneracy at ND is necessary.

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