More universal curve fits

• New stuff:
  – Parameterize using $Z = \log\left(\frac{E_{\text{measured}}}{E_{\text{predicted}}}\right)$
  – Compare with $K^0_S$ from TTT
Distribution of $dE/dx$

- $E_{\text{measured}} - E_{\text{predicted}}$ is not Gaussian but $Z = \log(E_{\text{measured}}/E_{\text{predicted}})$ is.
- Mostly affects the description of the tails:
Distribution of dE/dx

• Z is used by other experiments (eg, STAR) (not in itself a good reason to use it…)
• Tails are more important in likelihood analyses.
• Better (still not perfect) description of inclusive particle fractions
Fitted distributions in Z

• Comparison:

Smaller value of $-\log(\text{likelihood})$ for Z-fit.
Biases in $K^0_S$ from TTT

- Not large, but significant:

![Histogram](image1)

-1 -0.8 -0.6 -0.4 -0.2 0 0.2 0.4 0.6 0.8 1

$Z = \log(dE/dx(\text{measured})/dE/dx(\text{predicted}))$

Mean = 0.0436$\pm$ 0.0005

![Histogram](image2)

-1 -0.8 -0.6 -0.4 -0.2 0 0.2 0.4 0.6 0.8 1

$Z = \log(dE/dx(\text{measured})/dE/dx(\text{predicted}))$

Mean = 0.0450$\pm$ 0.0006
Biases in $K^0_S$ from TTT

- Pull distributions:

![Graph for positive tracks](image)

- Mean = 0.437 ± 0.005
- RMS = 0.921 ± 0.004

![Graph for negative tracks](image)

- Mean = 0.411 ± 0.005
- RMS = 0.875 ± 0.004
Current issues

- Is the “standard CDF” parameterization adequate?
- Better way to parameterize resolution?
  - I think it is currently overestimated
- Probably would benefit from constraints at higher momentum (e.g., $\gamma \rightarrow e^+e^-, K^0_S \rightarrow \pi^+\pi^-$)
- Need to compare with $K^0_S$ from minimum bias data