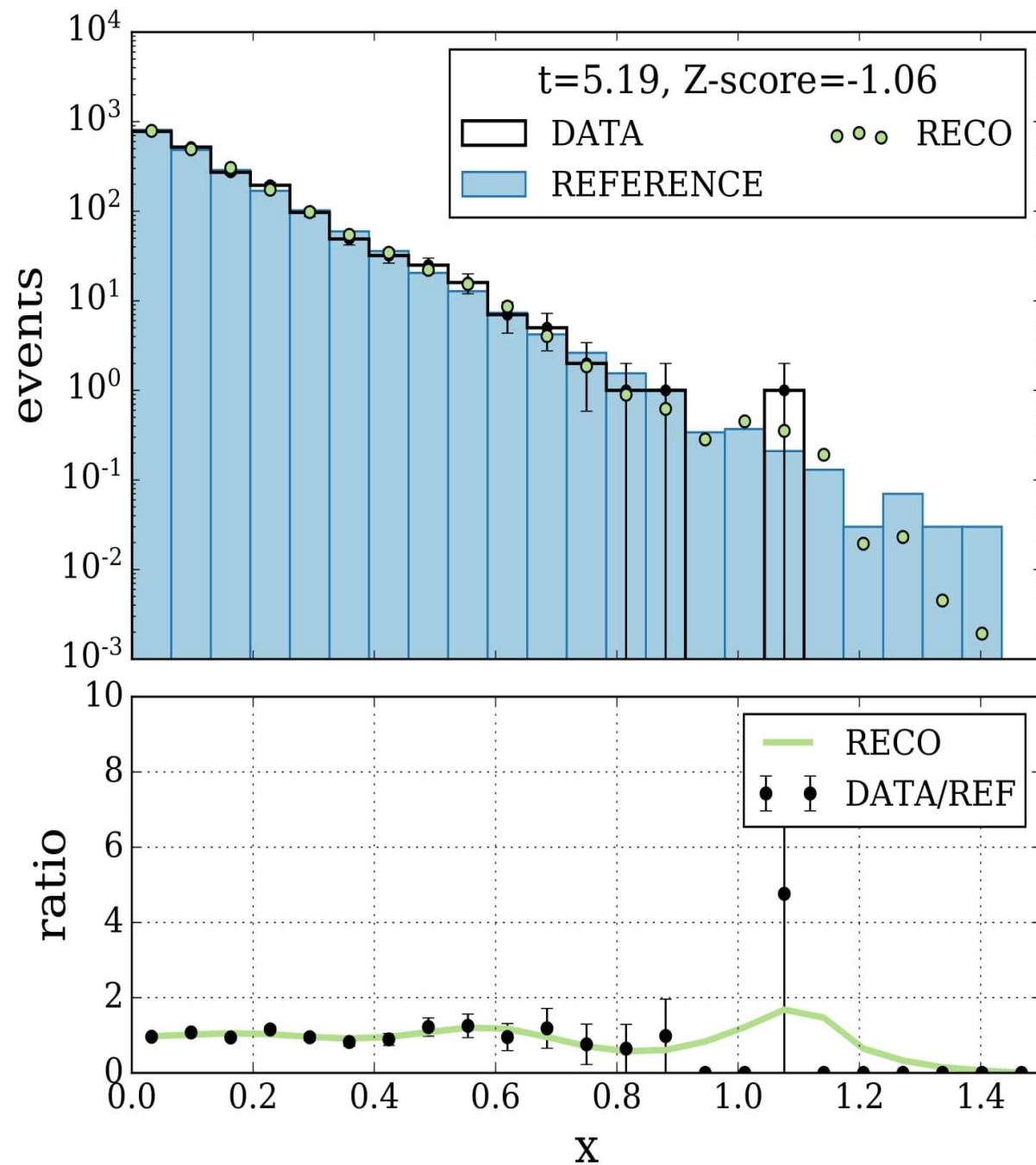# Presentation 2

Fixed parameters:

- $N\_0 = 200000$ (reference sample)
- $N0 = 2000$ (expected background)
- Weight = $N0 / N\_0$
- $M = 3000$ (centers)
- Lambda $= 1e-9$ (regularization parameter)
- Falkon sigma $= 0.3$ (90th percentile pairwise distance)

Reference data distribution

- Parameters:
- Run over 100 toy examples
- Ns = 0
- Execution time: 3h 41m 33s

Degrees of Freedom:

- Removing the negative values in t-observed over 100 toy example for reference data

- using the Kolmogorov-Smirnov test to determine the best "dof", which yields a p-value corresponding to the specified degrees of freedom.

- DoF = 8.469
- p-value = 0.0439

Procedure:

- We may then proceed to correct it and add additional signals to the toy trials based on their level of recognition after determining the best "dof" (10 for Guassian signals in tails, 90 for non-resonant and Guasian signals in bulk).

- Then run 50 toy experiments (due to trianing time limitation).

Data Distribution after adding 10 gaussian signals to the tail

- Parameters:
- Run over 50 toy examples
- NS=10
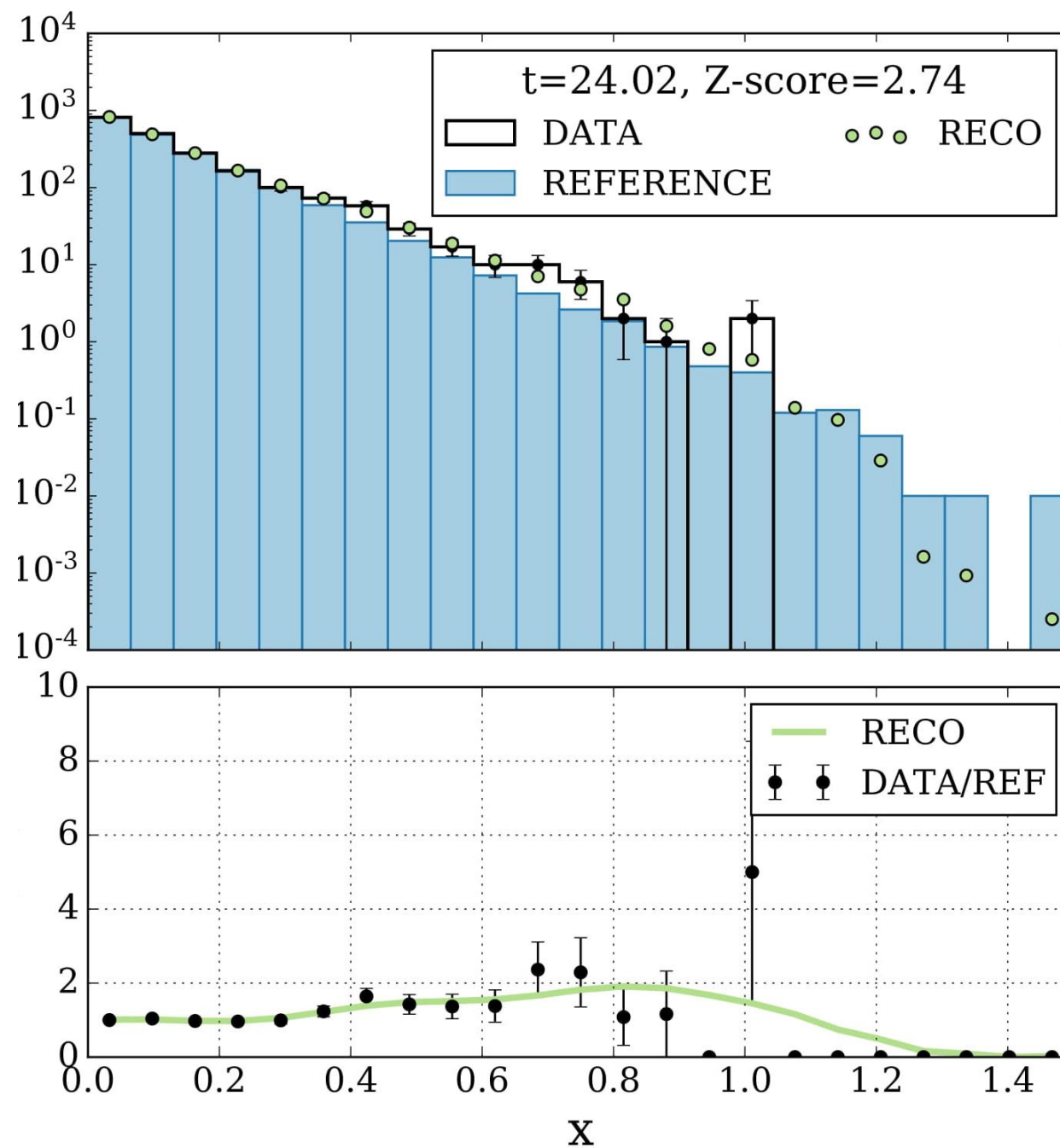- Execution time : 2h 12m 1s
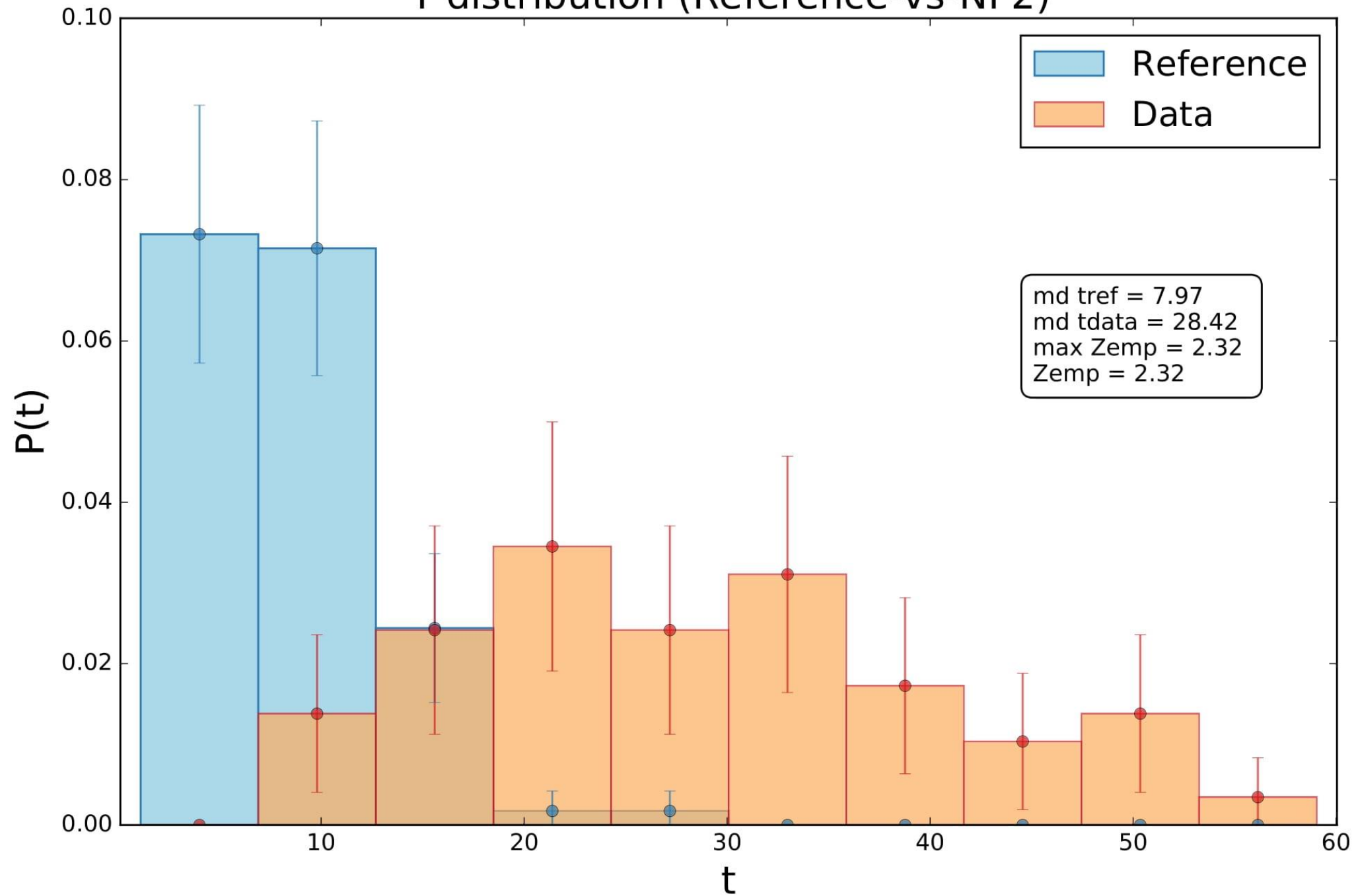
T distribution (Reference-vs-NP1)

md tref = 7.97
md tdata = 18.45
max Zemp = 2.32
Zemp = 2.05
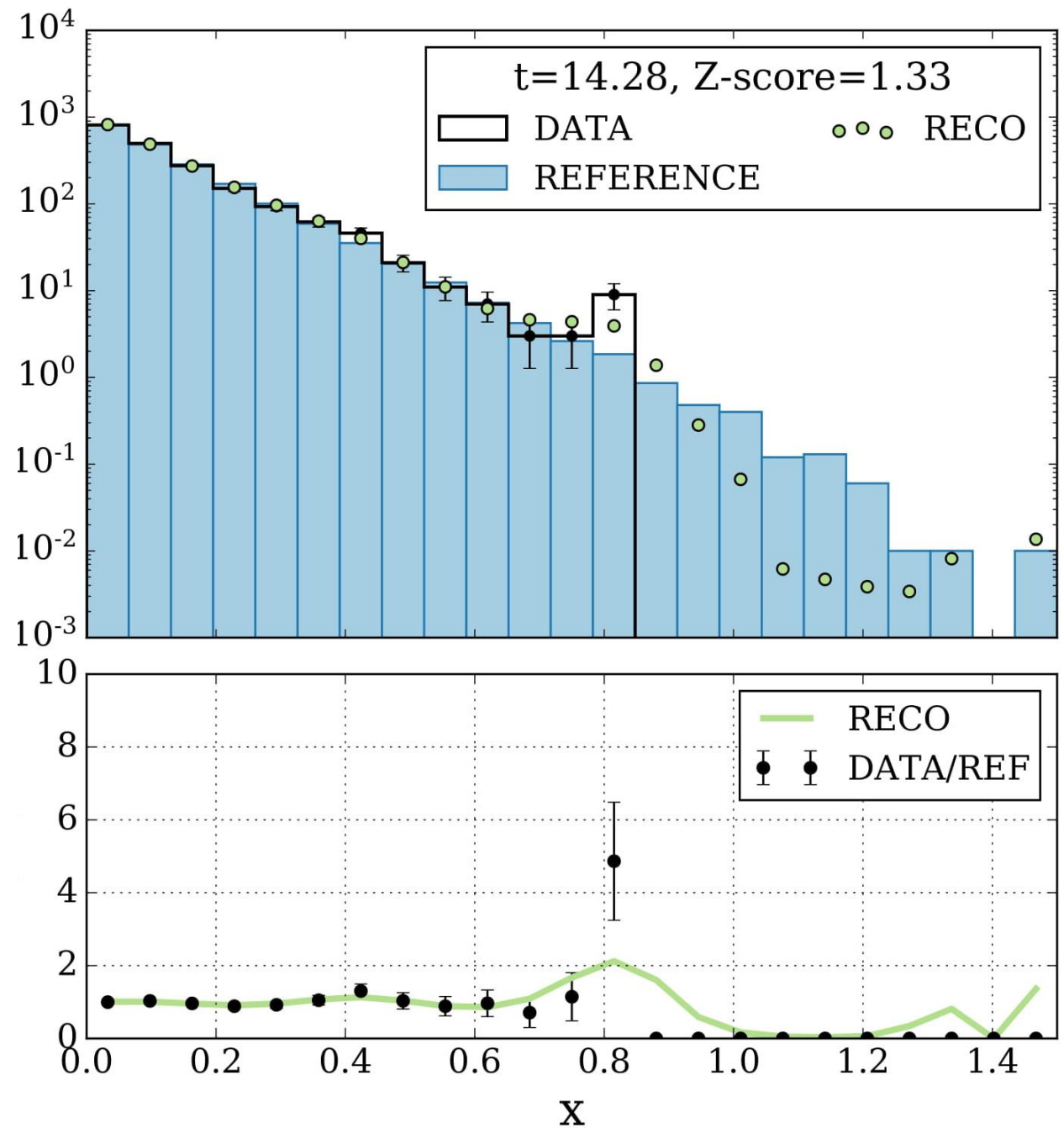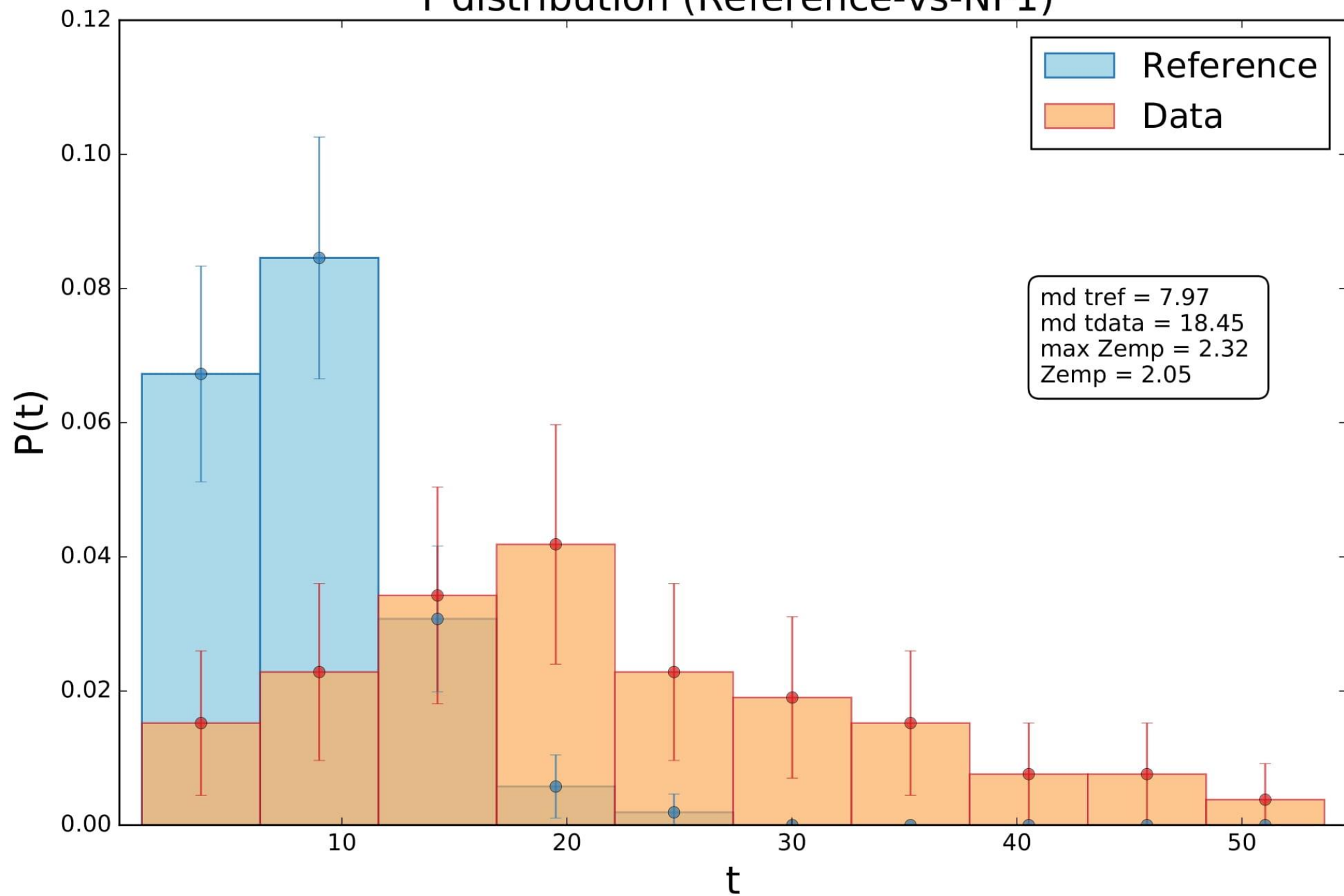
Data Distribution after adding 90 non-resonant signals

- Parameters:
- Run over 50 toy examples
- NS=90
- Execution time: 2h 36m 27s

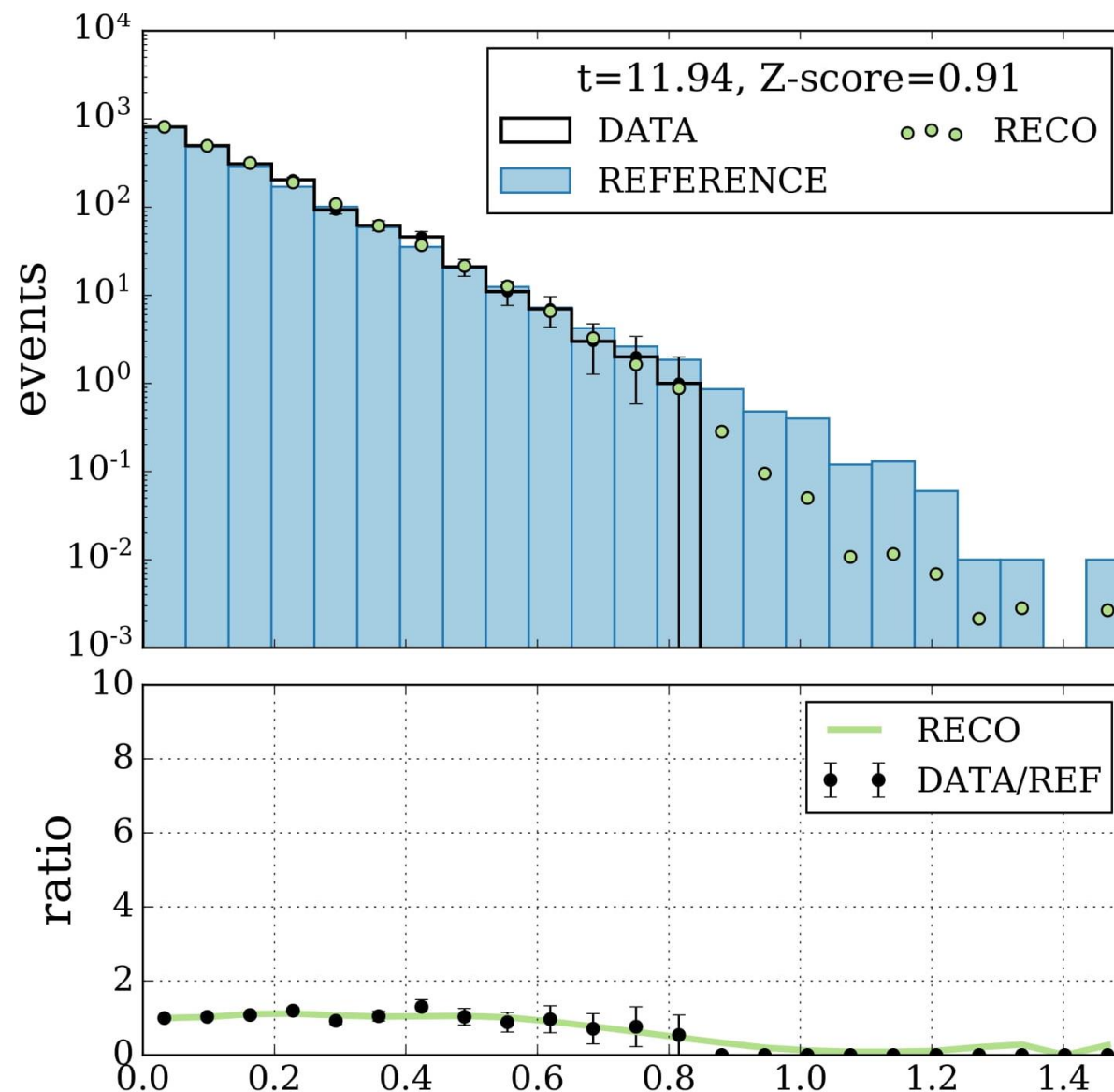T distribution (Reference-vs-NP2)

md tref = 7.97
md tdata = 28.42
max Zemp = 2.32
Zemp = 2.32

Data Distribution after adding 90 gaussian signals to the bulk

- Parameters:
- Run over 50 toy examples
- NS=90
- Execution time : 2h 27m 19s

T distribution (Reference-vs-NP3)

md tref = 7.97
md tdata = 25.59
max Zemp = 2.32
Zemp = 2.32