

Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

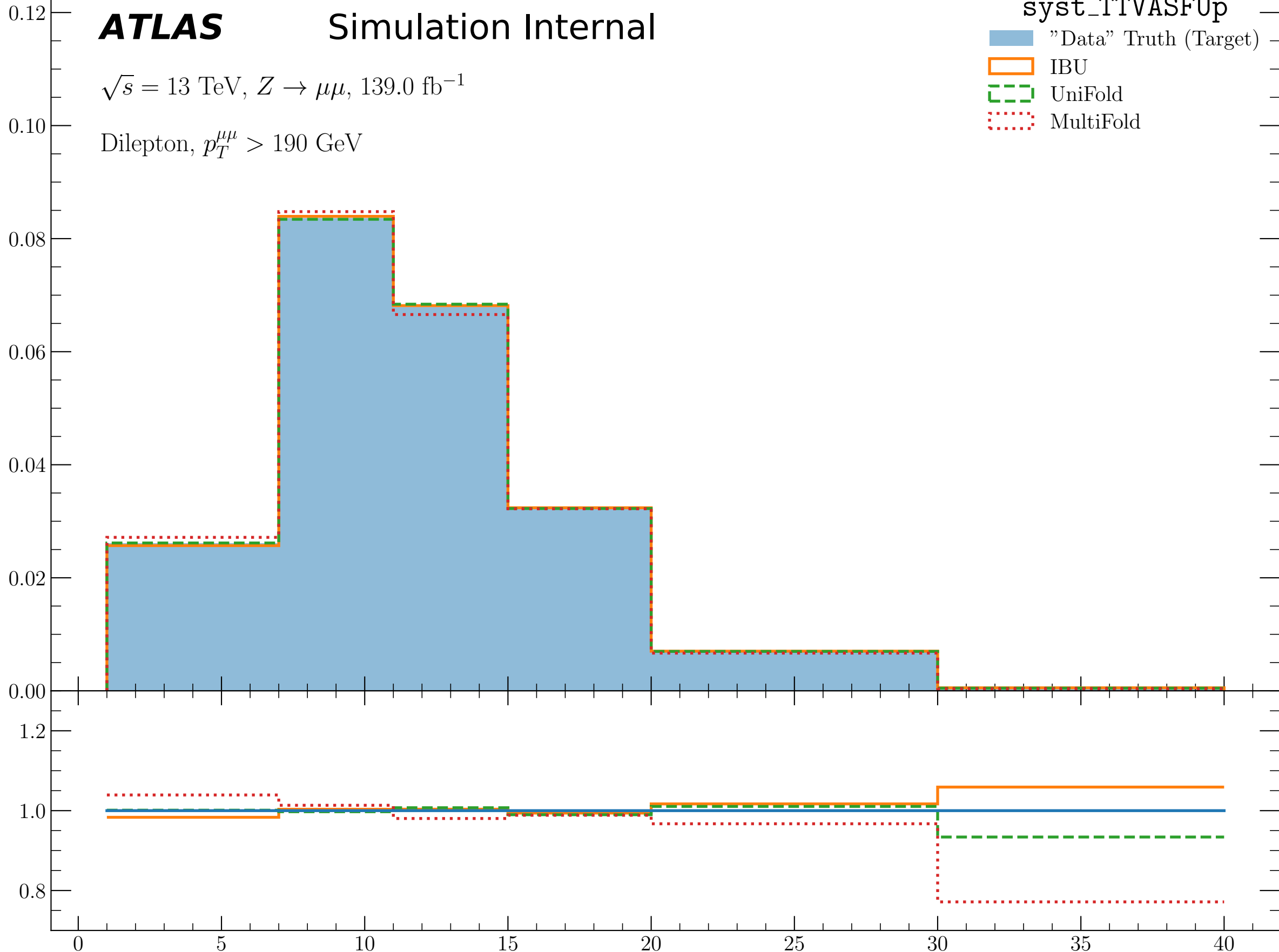
Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

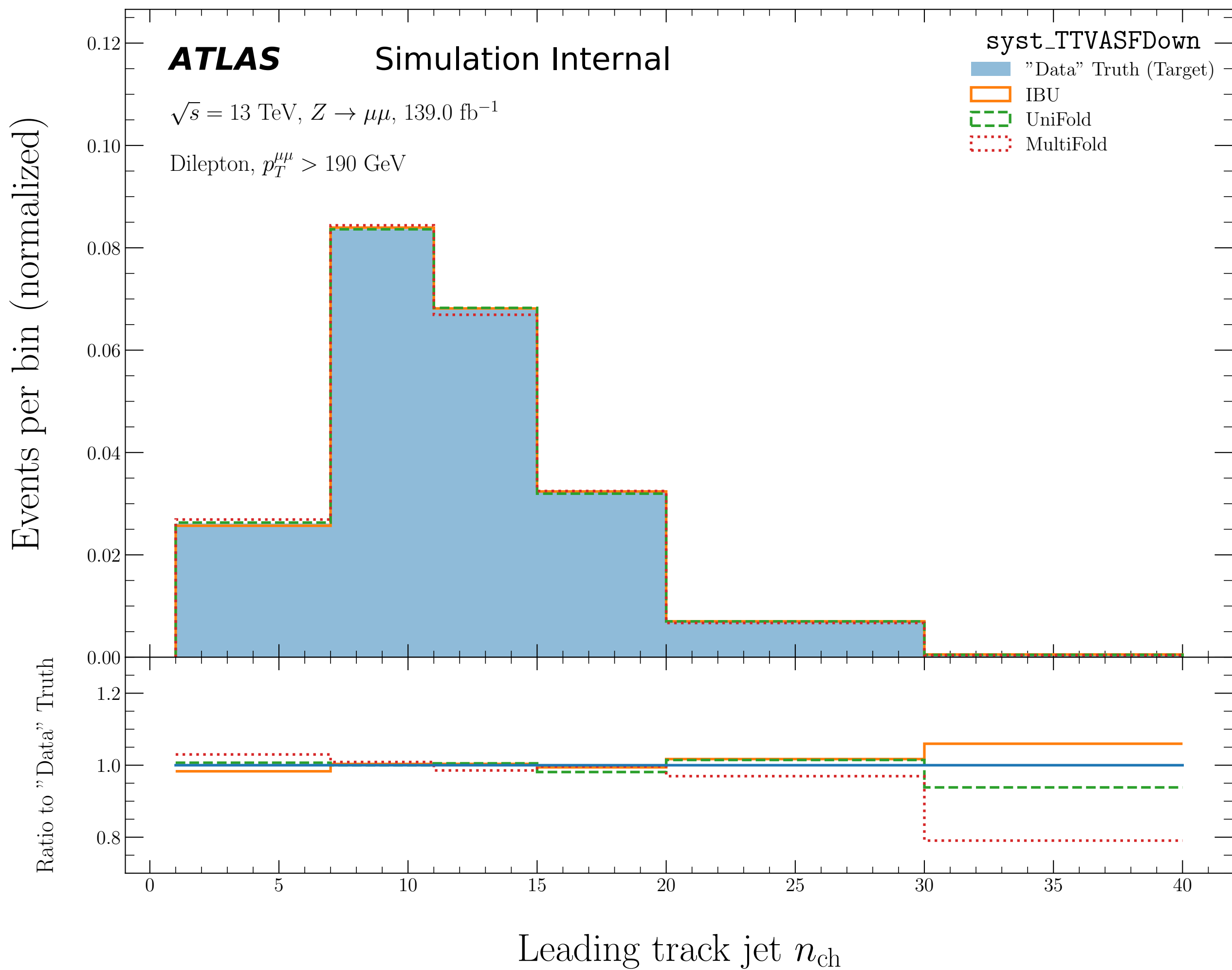
syst\_TTVASFUp

- "Data" Truth (Target)
- IBU
- UniFold
- MultiFold

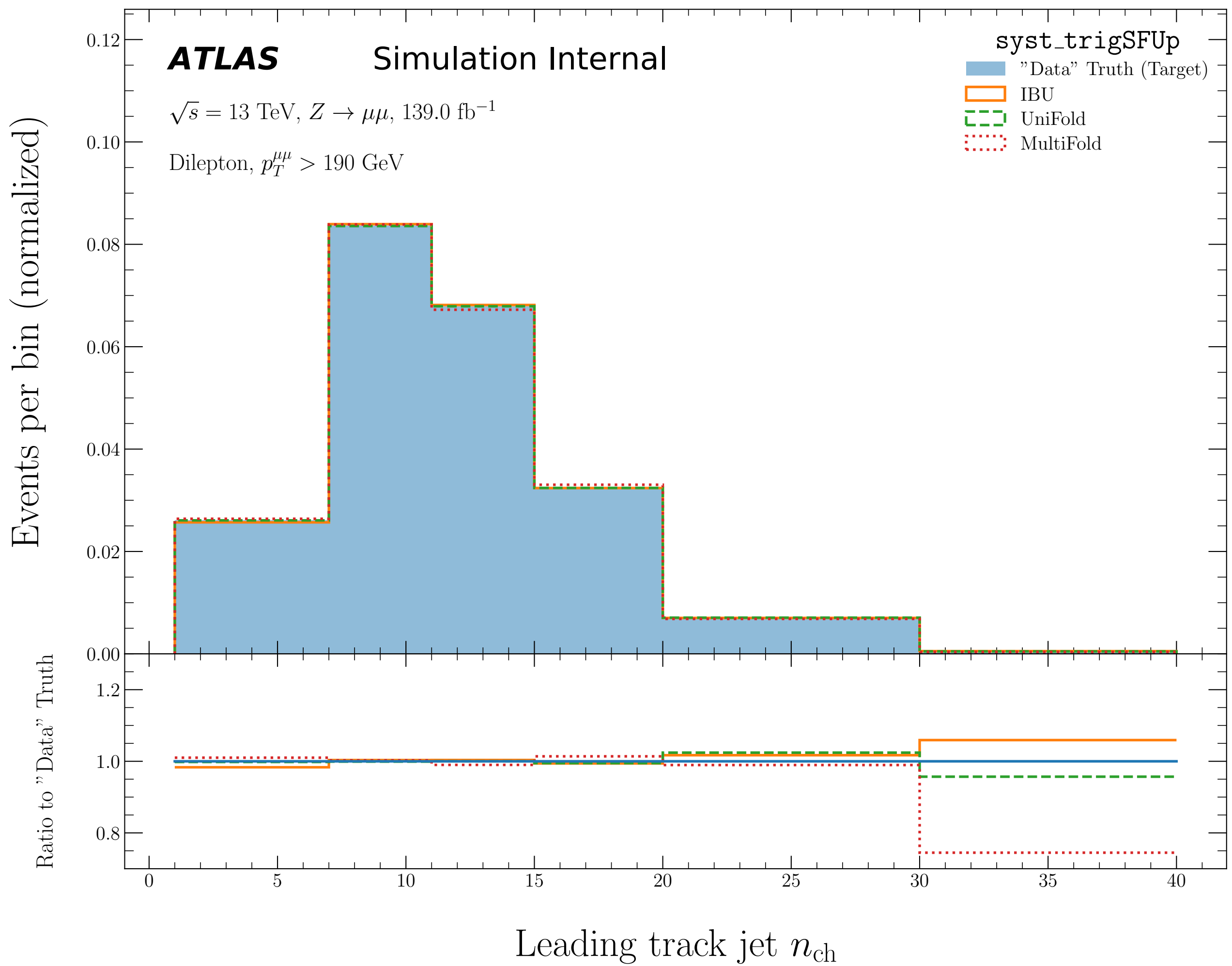
Ratio to "Data" Truth

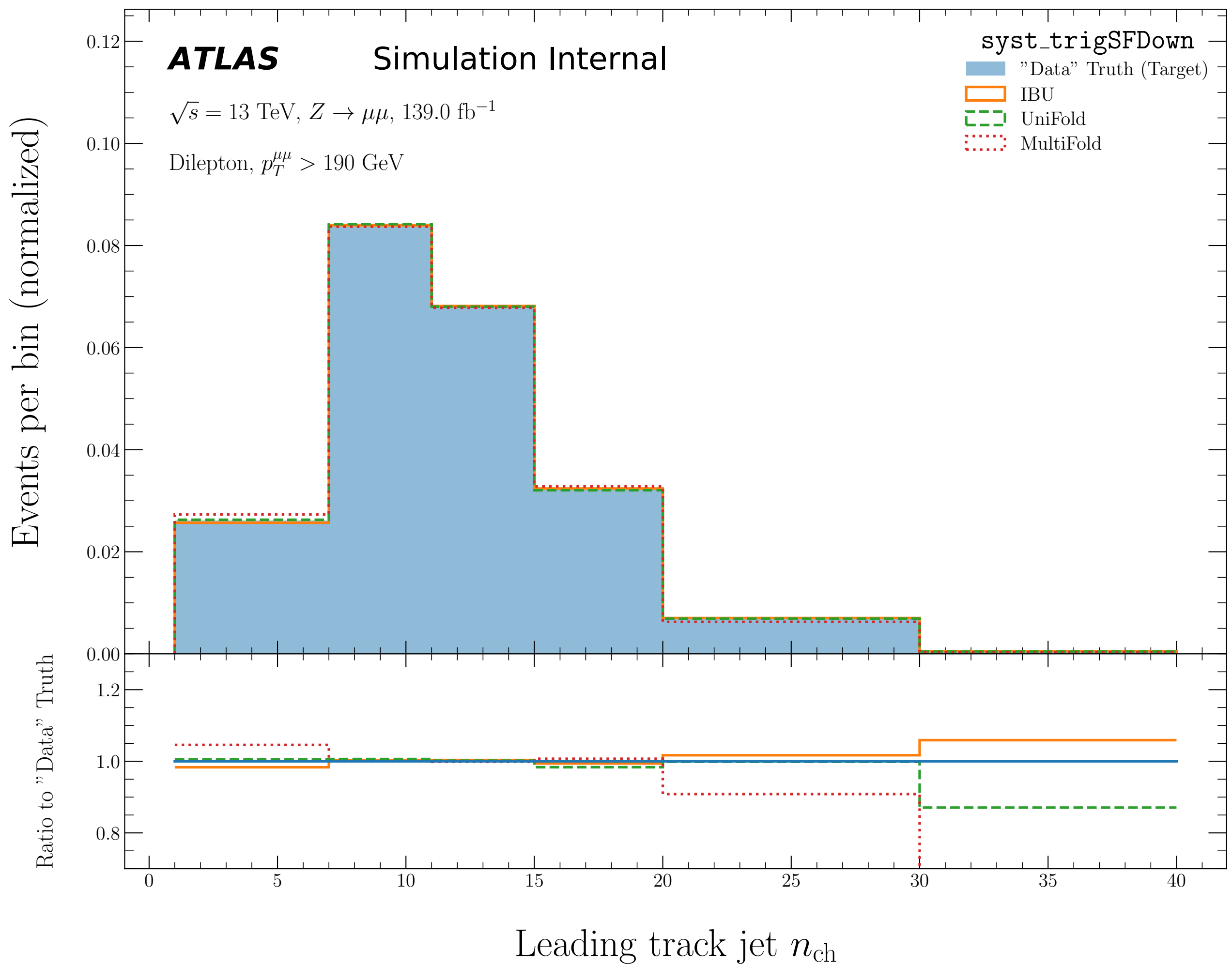
Leading track jet  $n_{\text{ch}}$

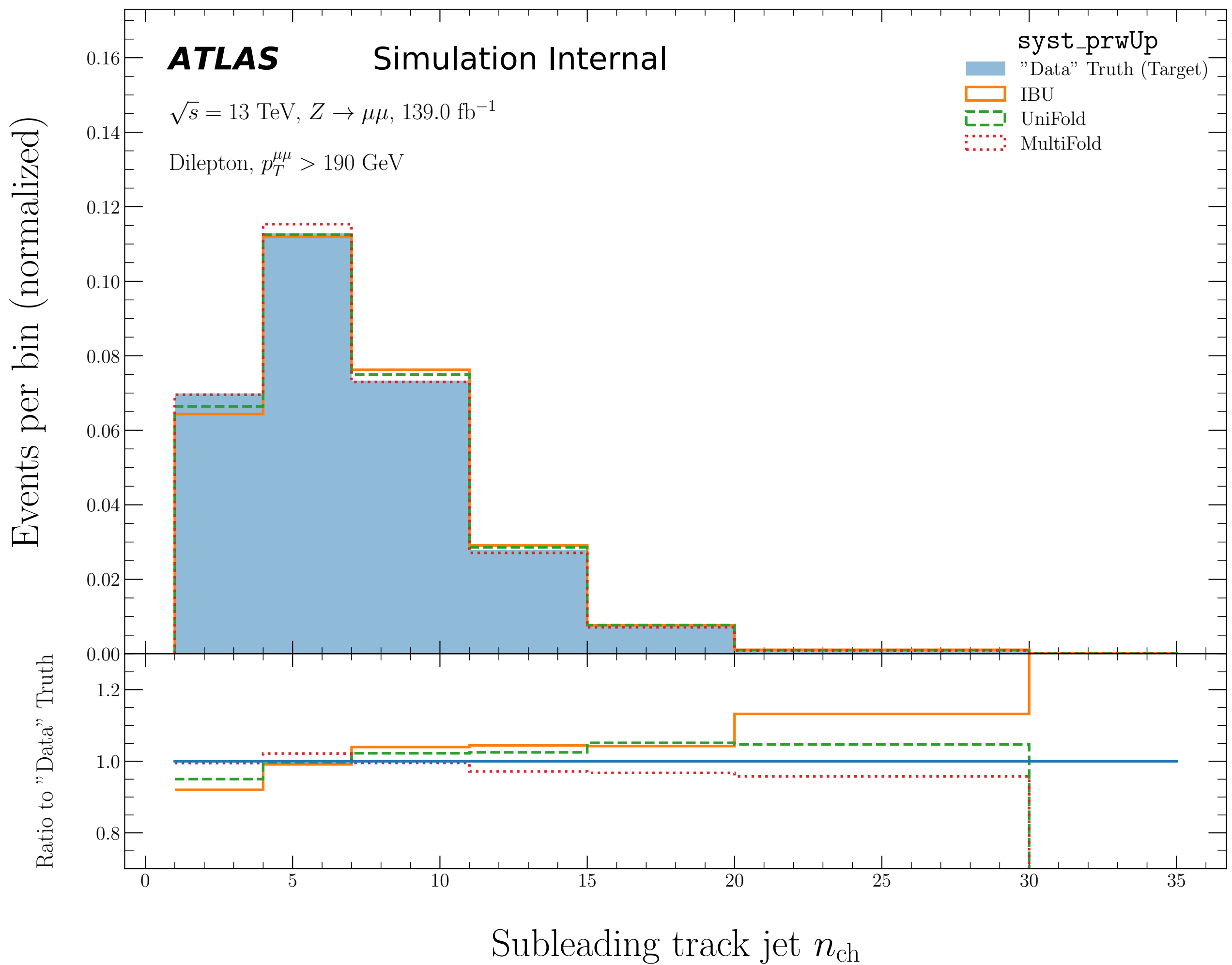


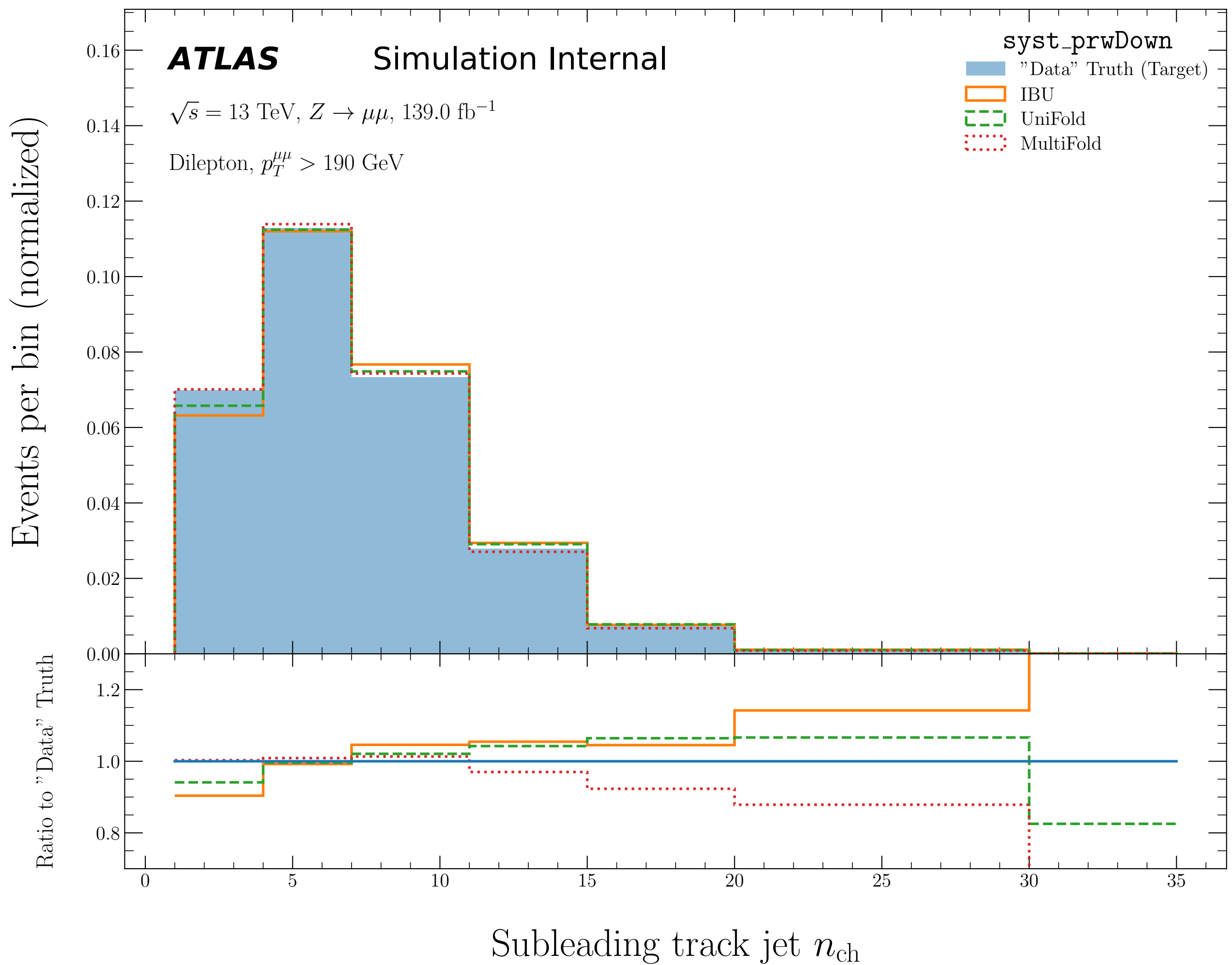


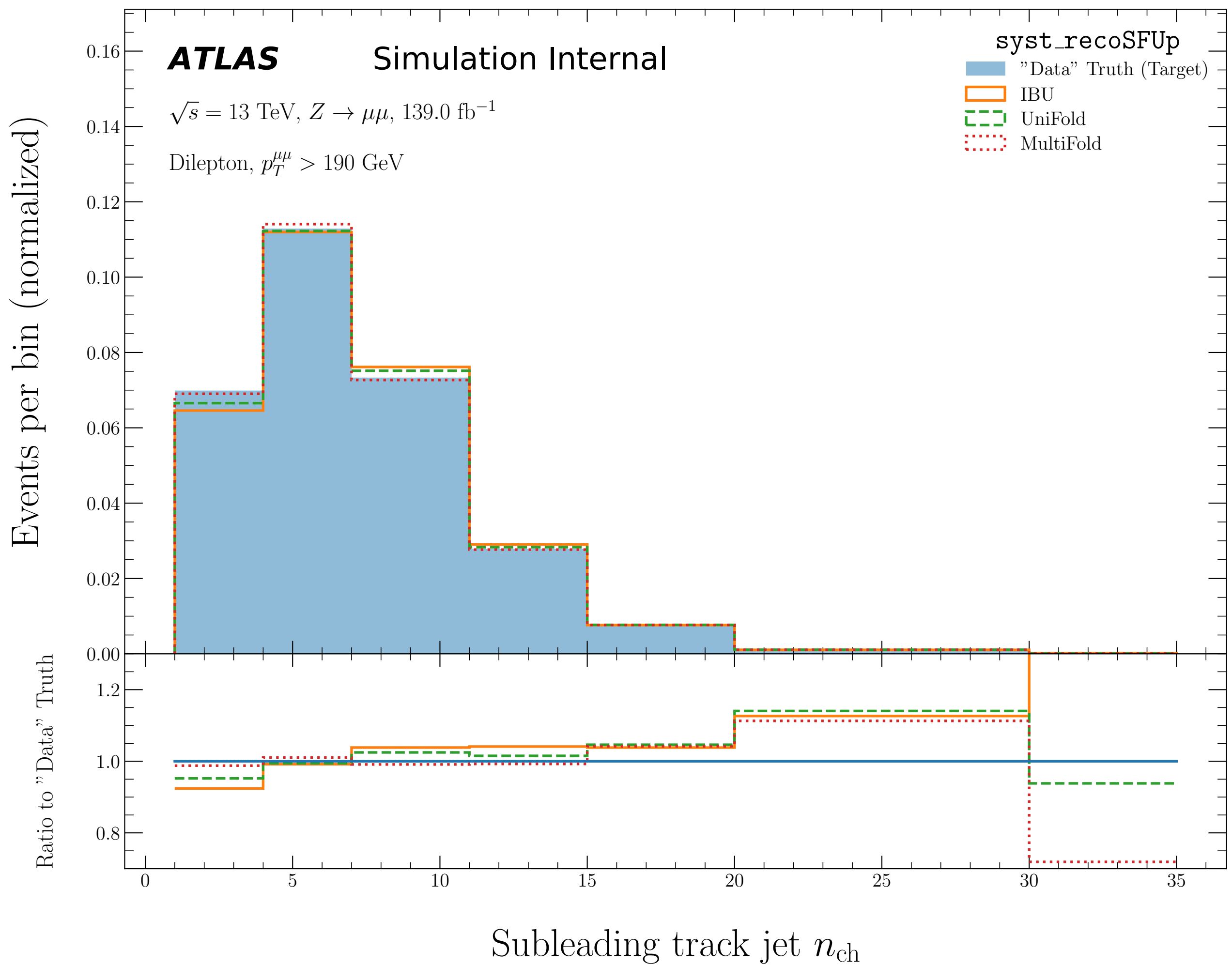


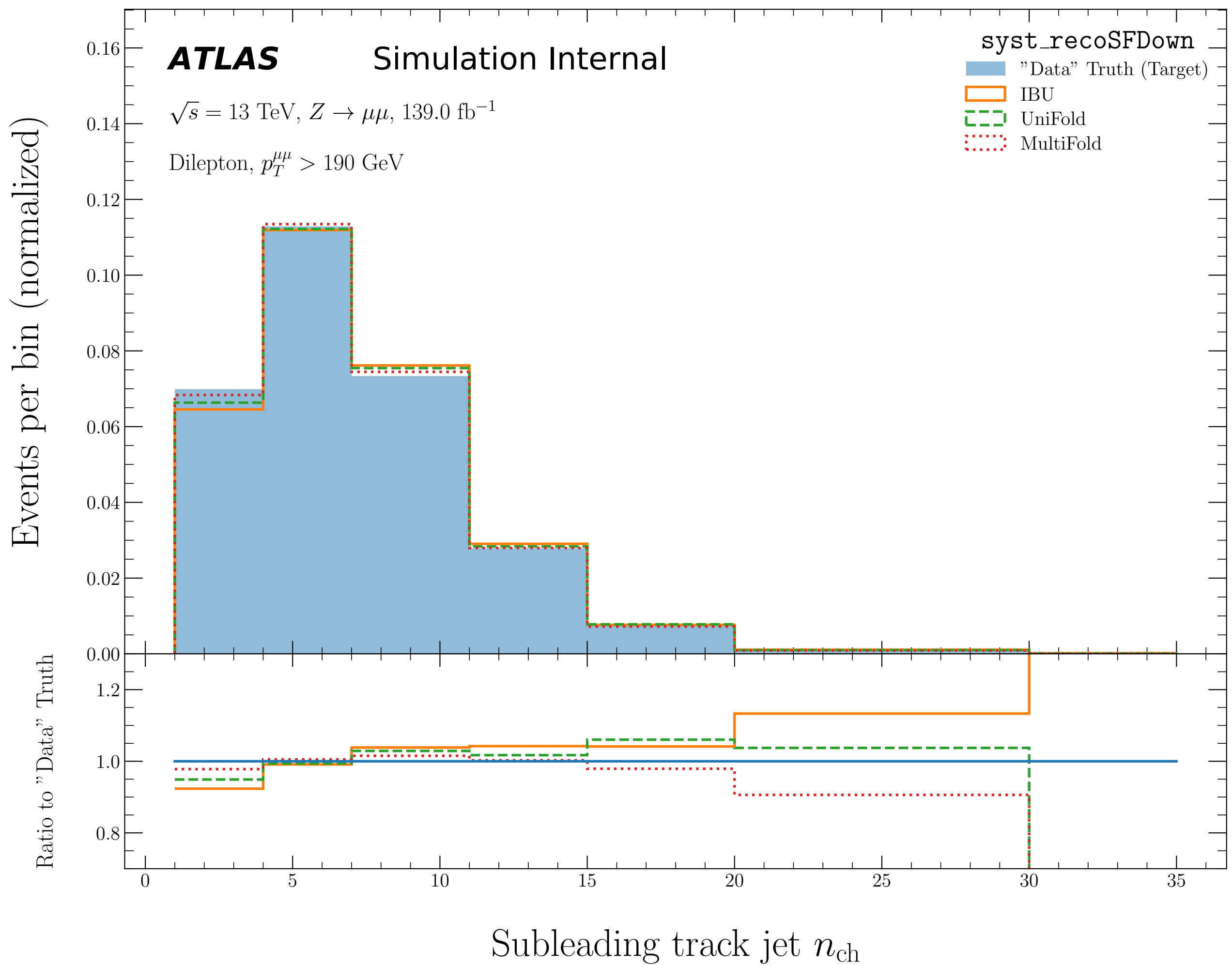


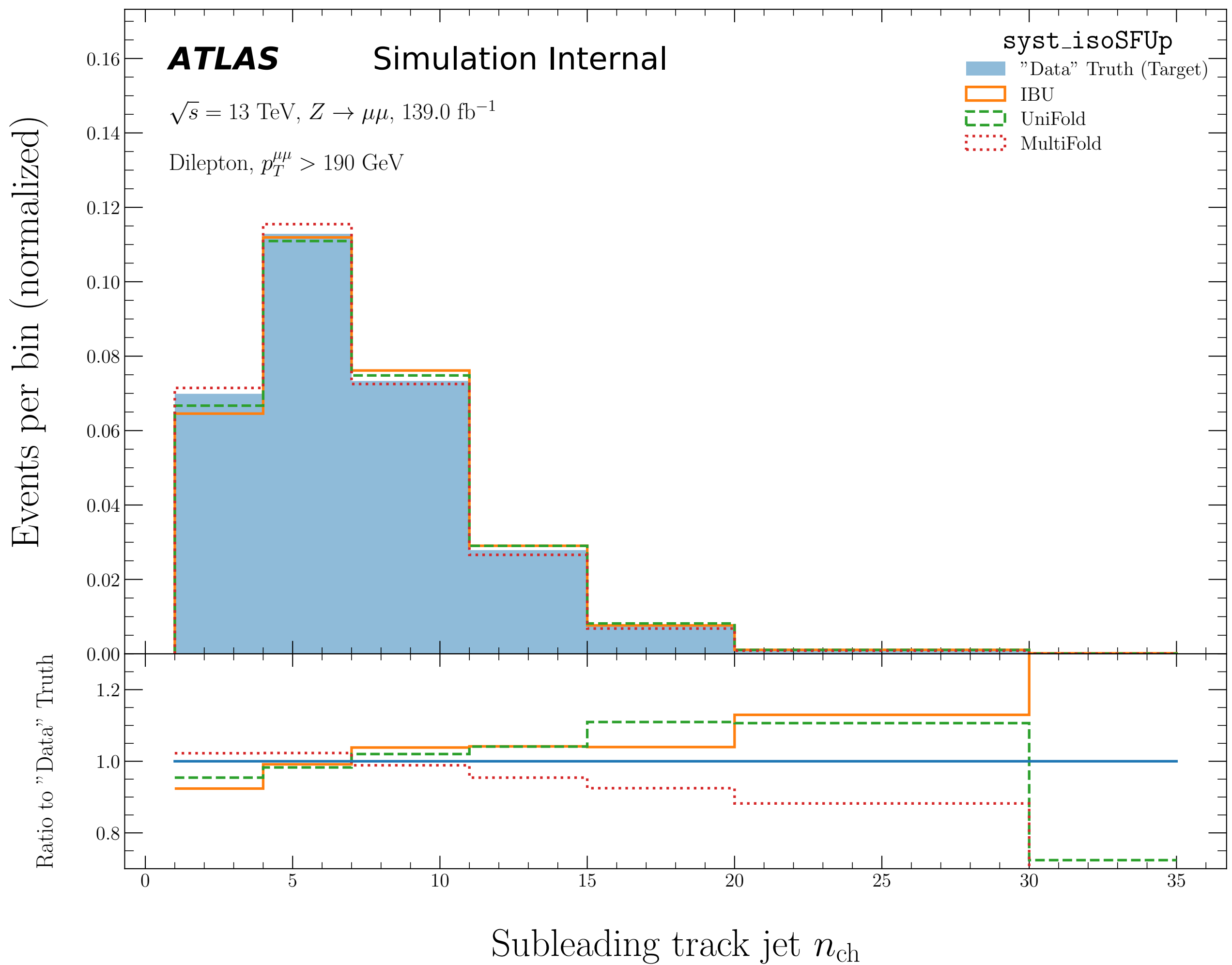


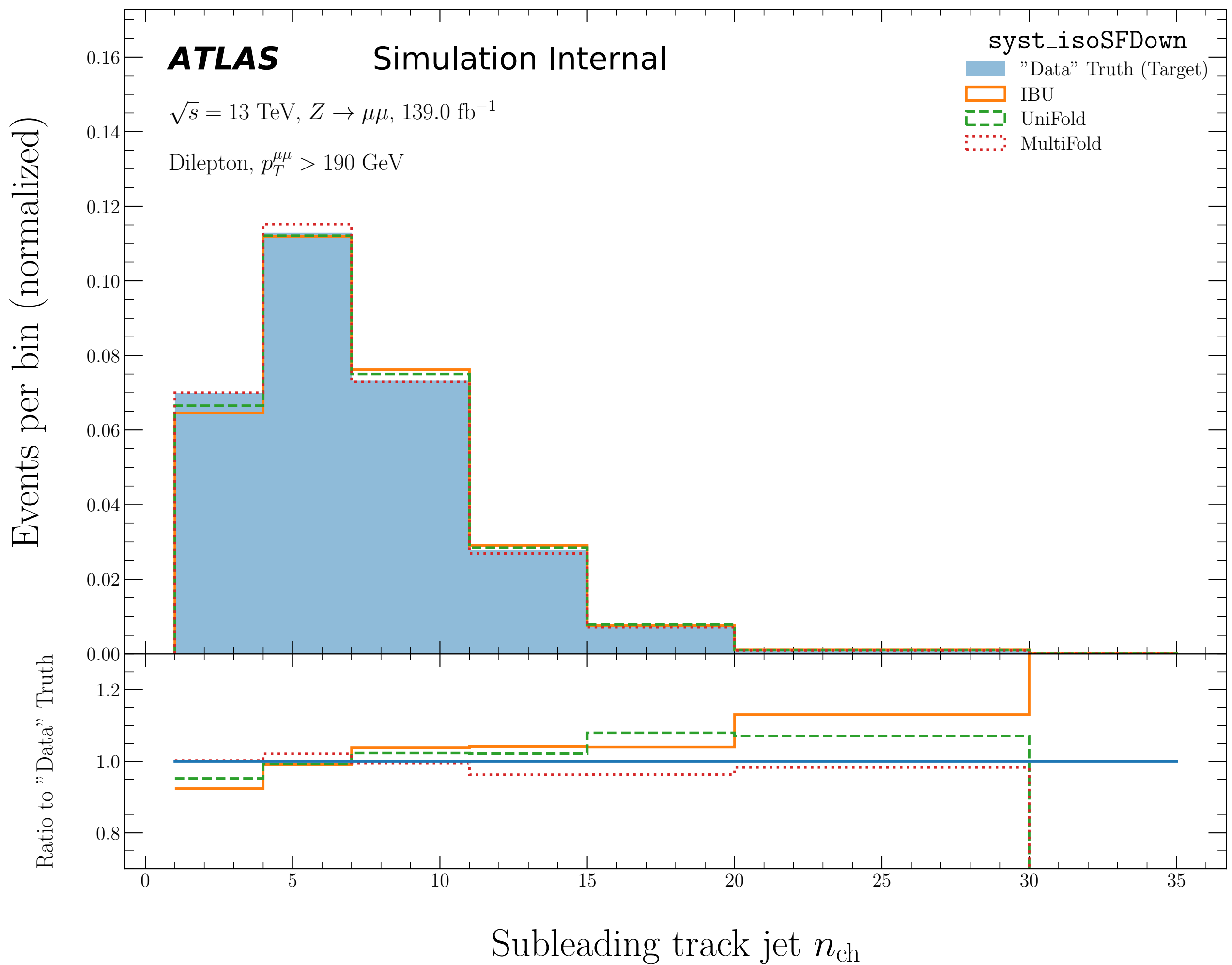




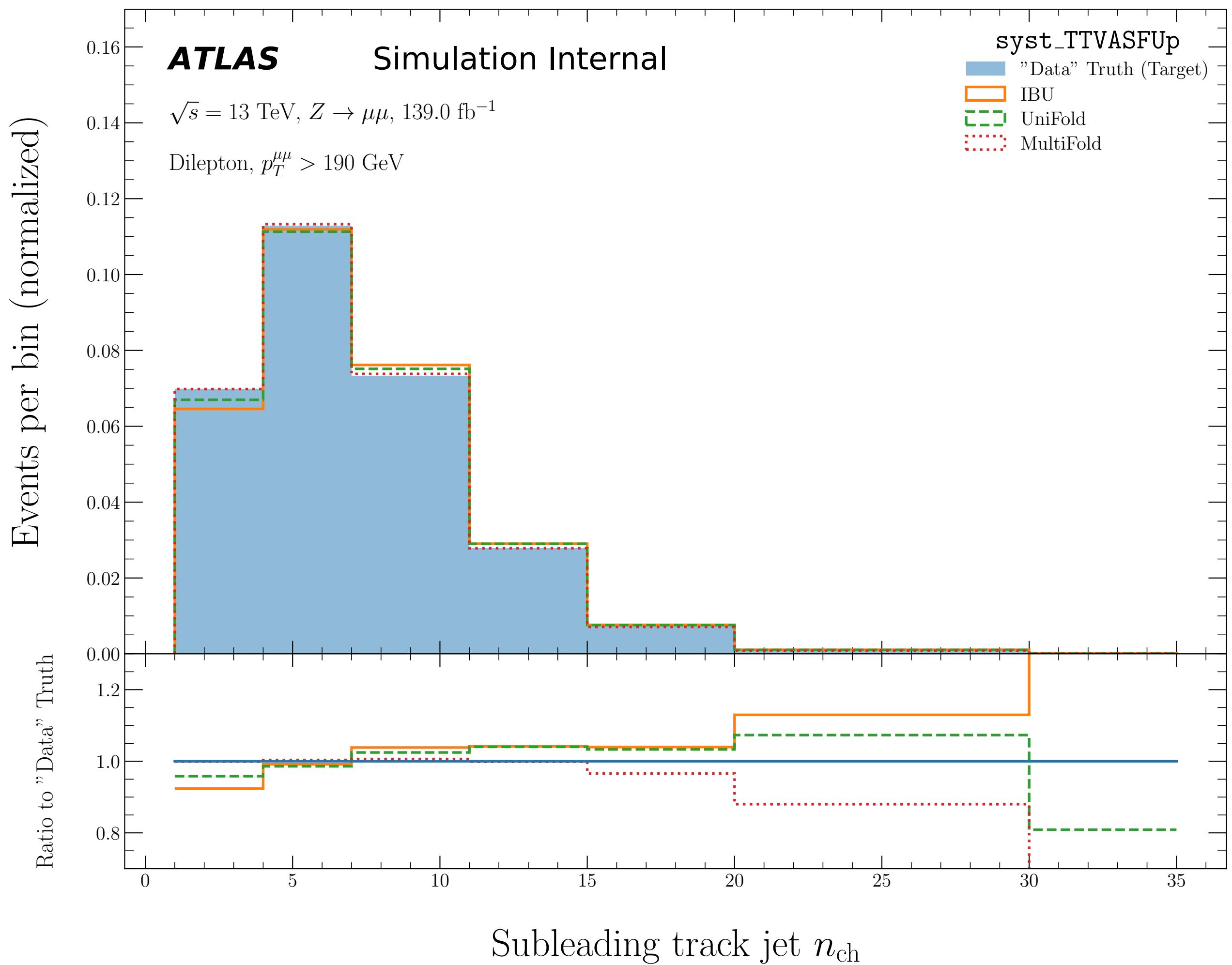


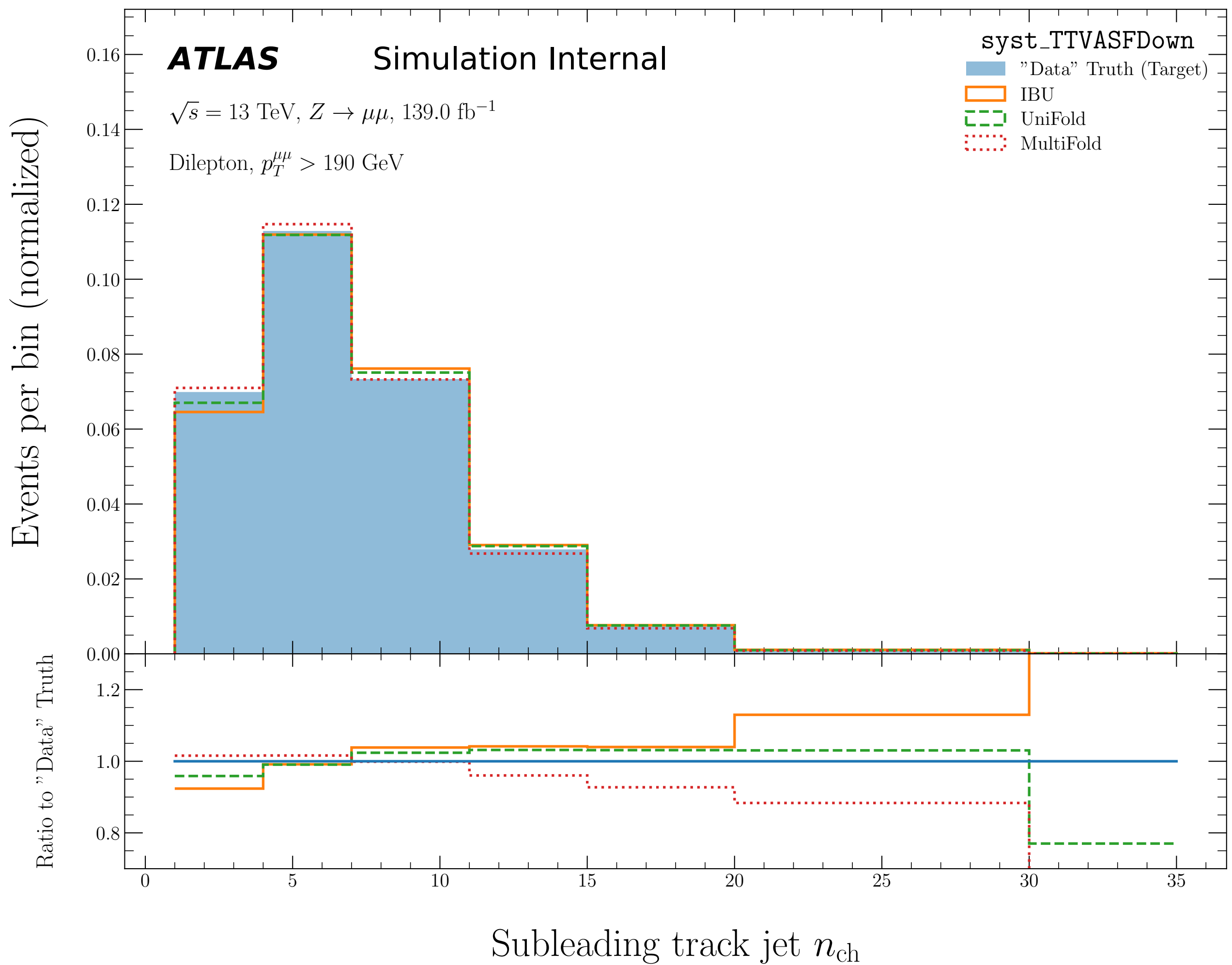


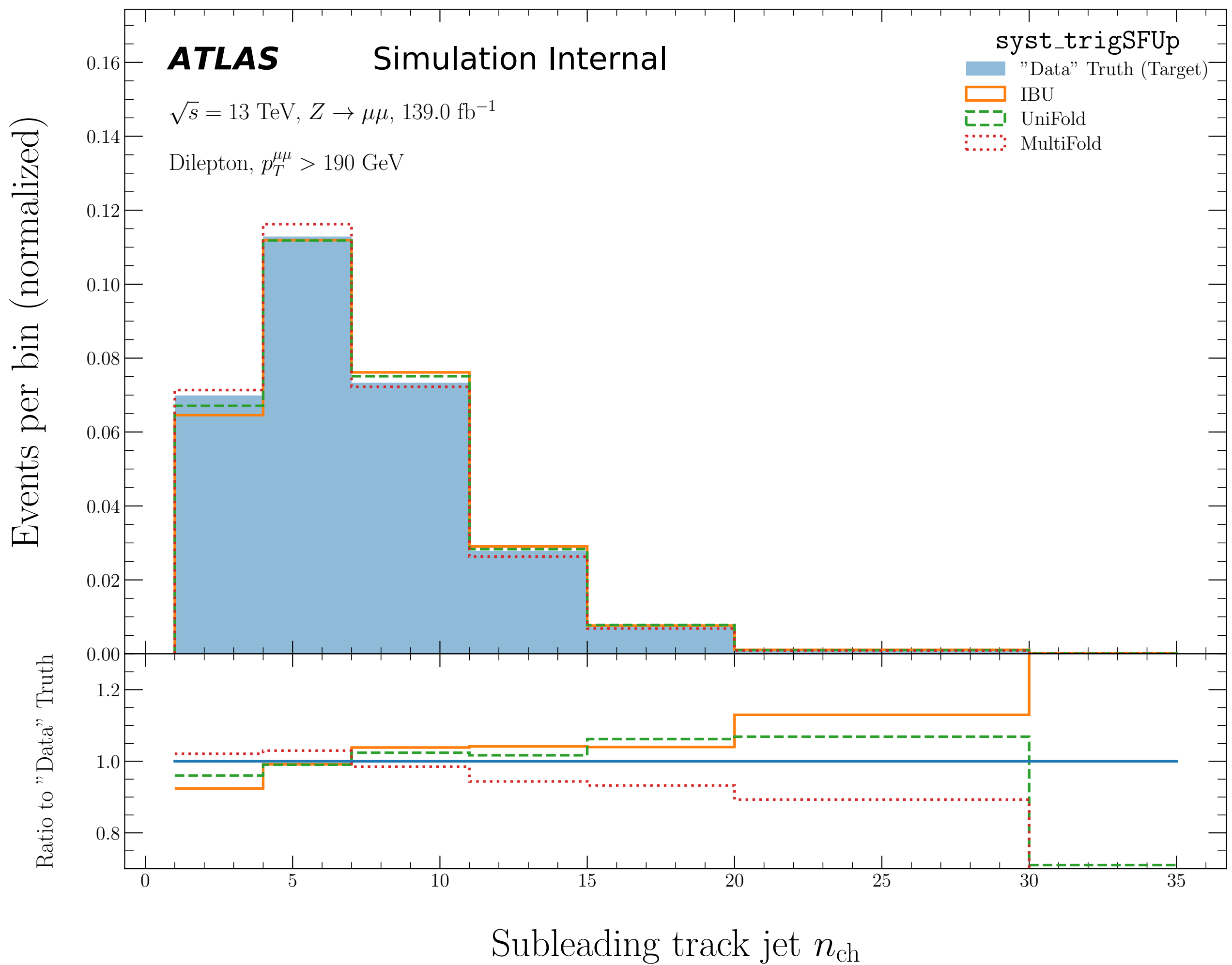


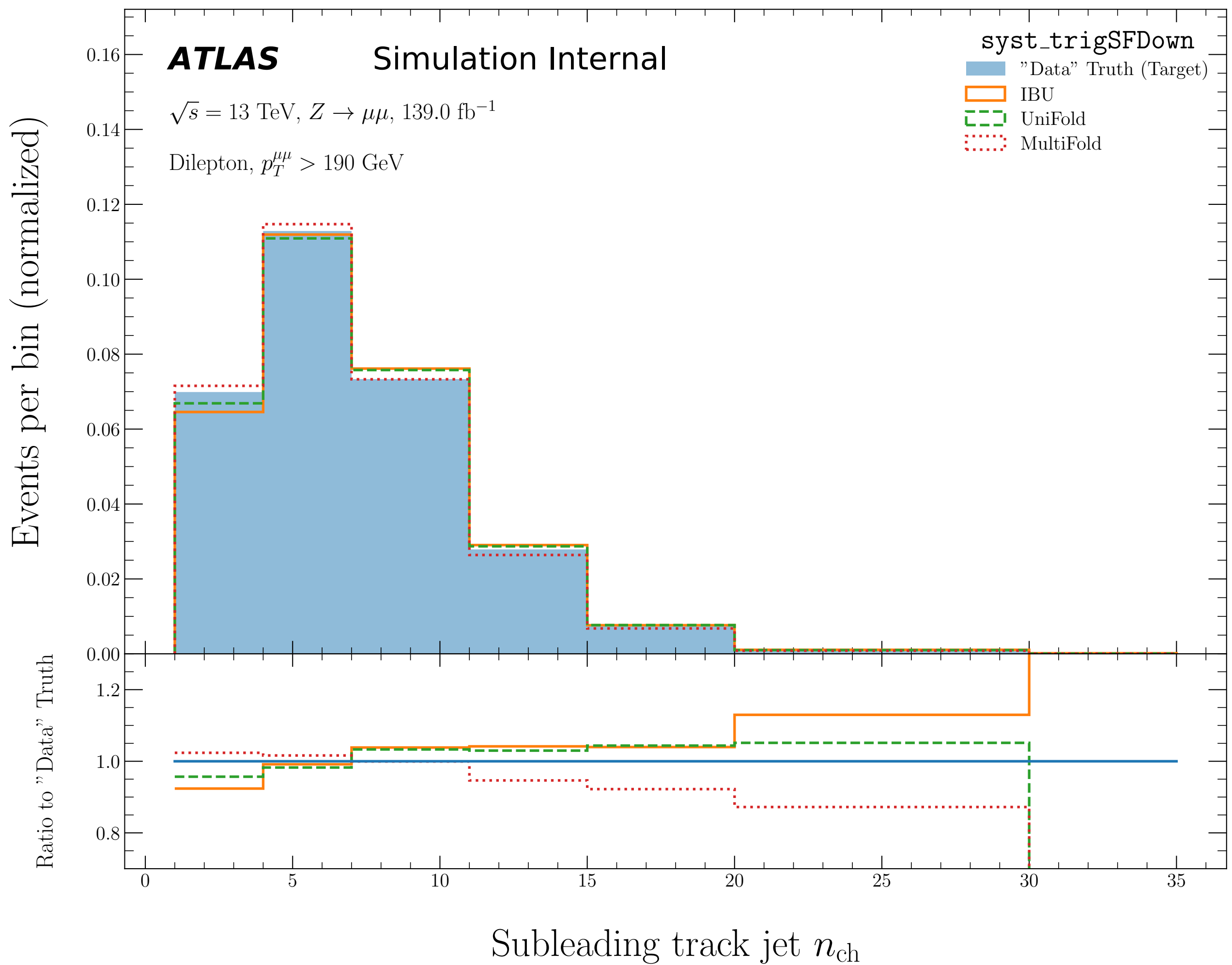


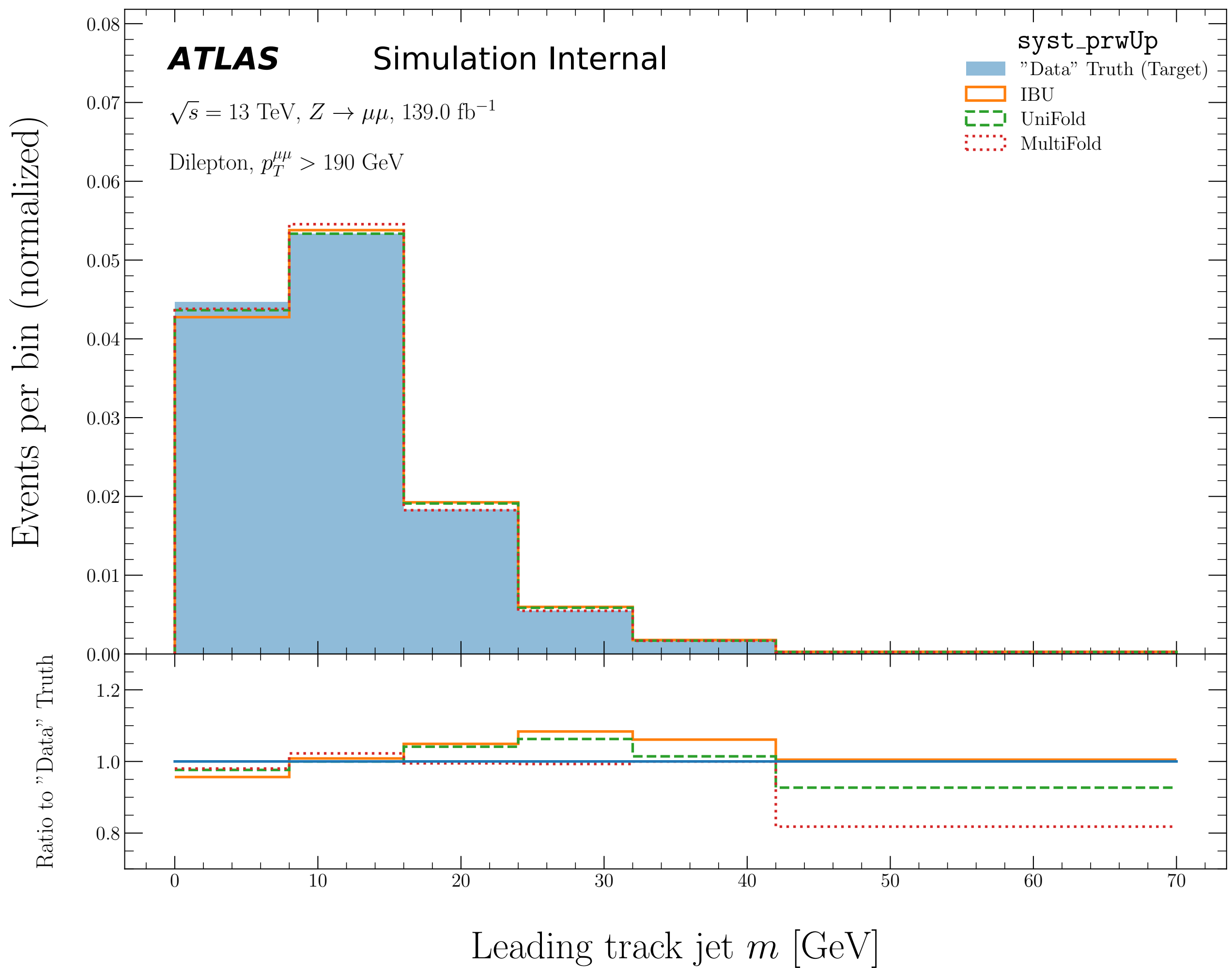


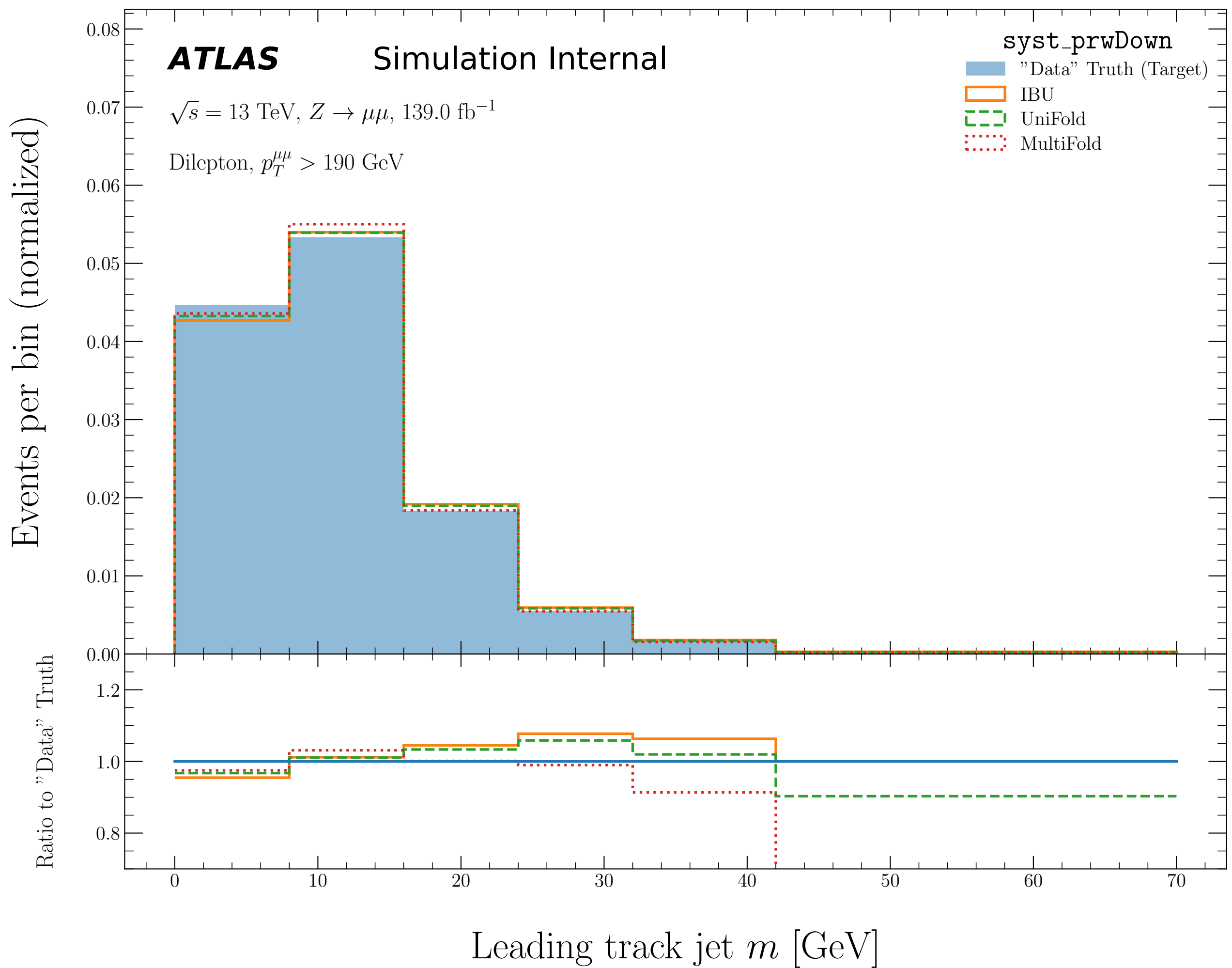


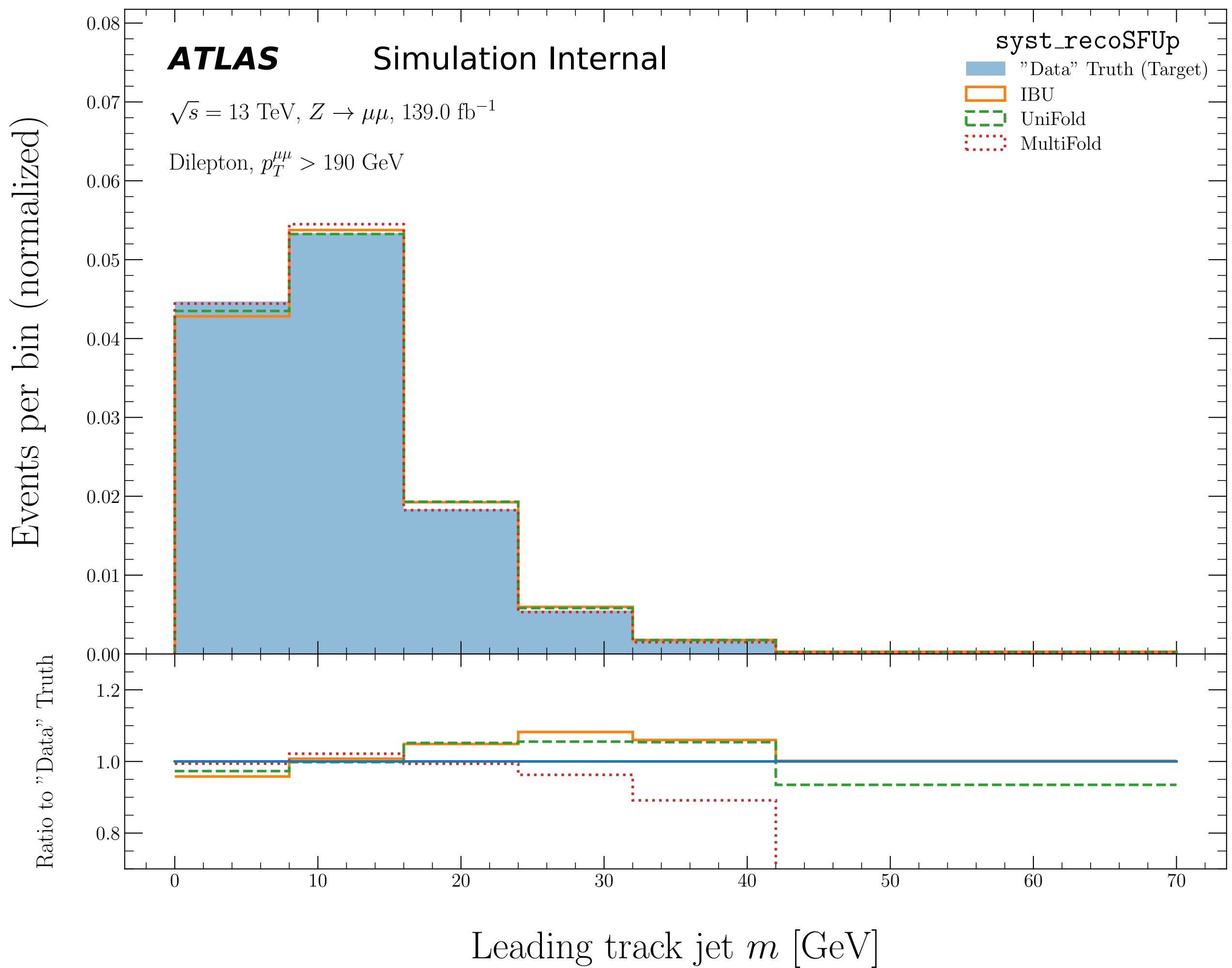


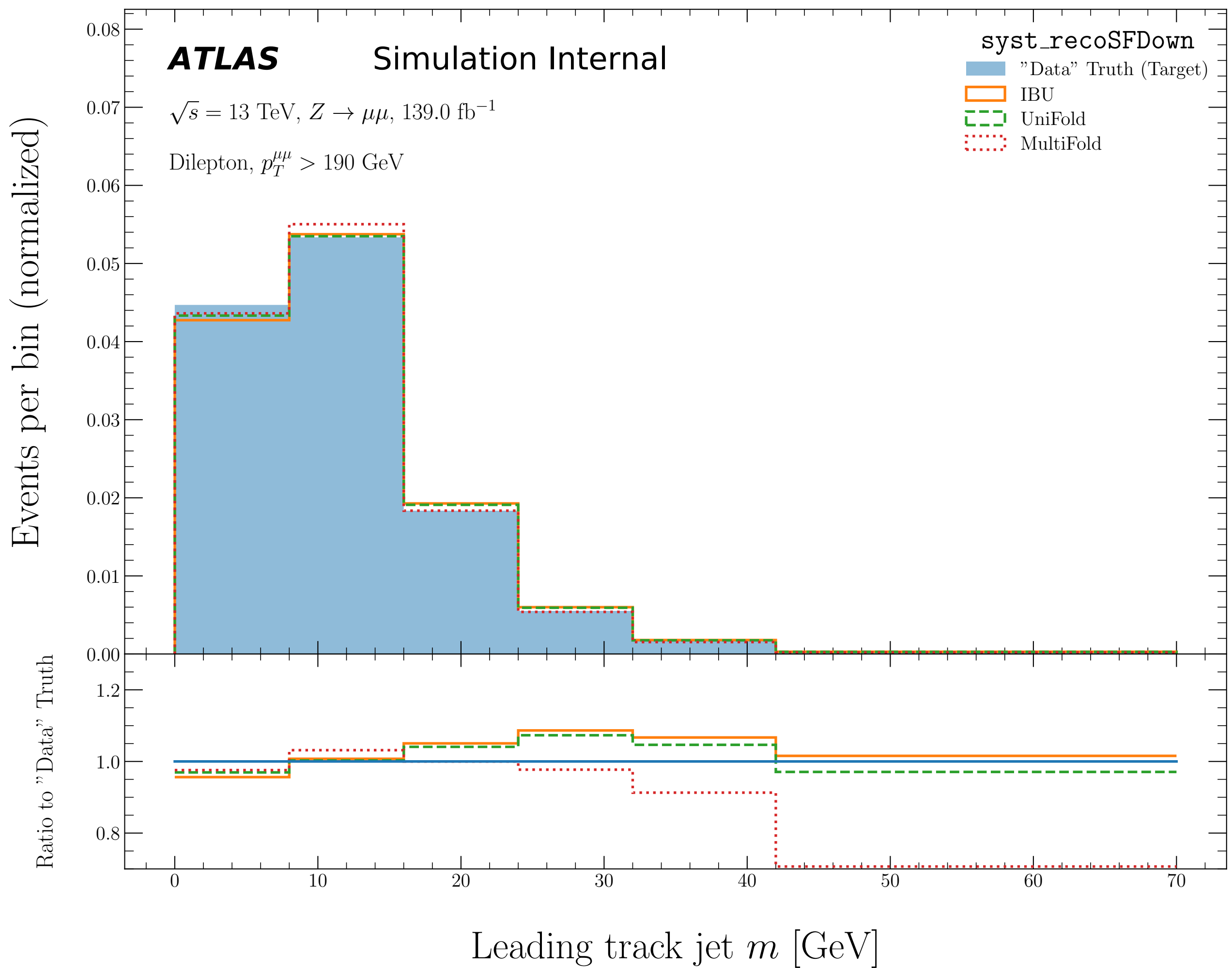




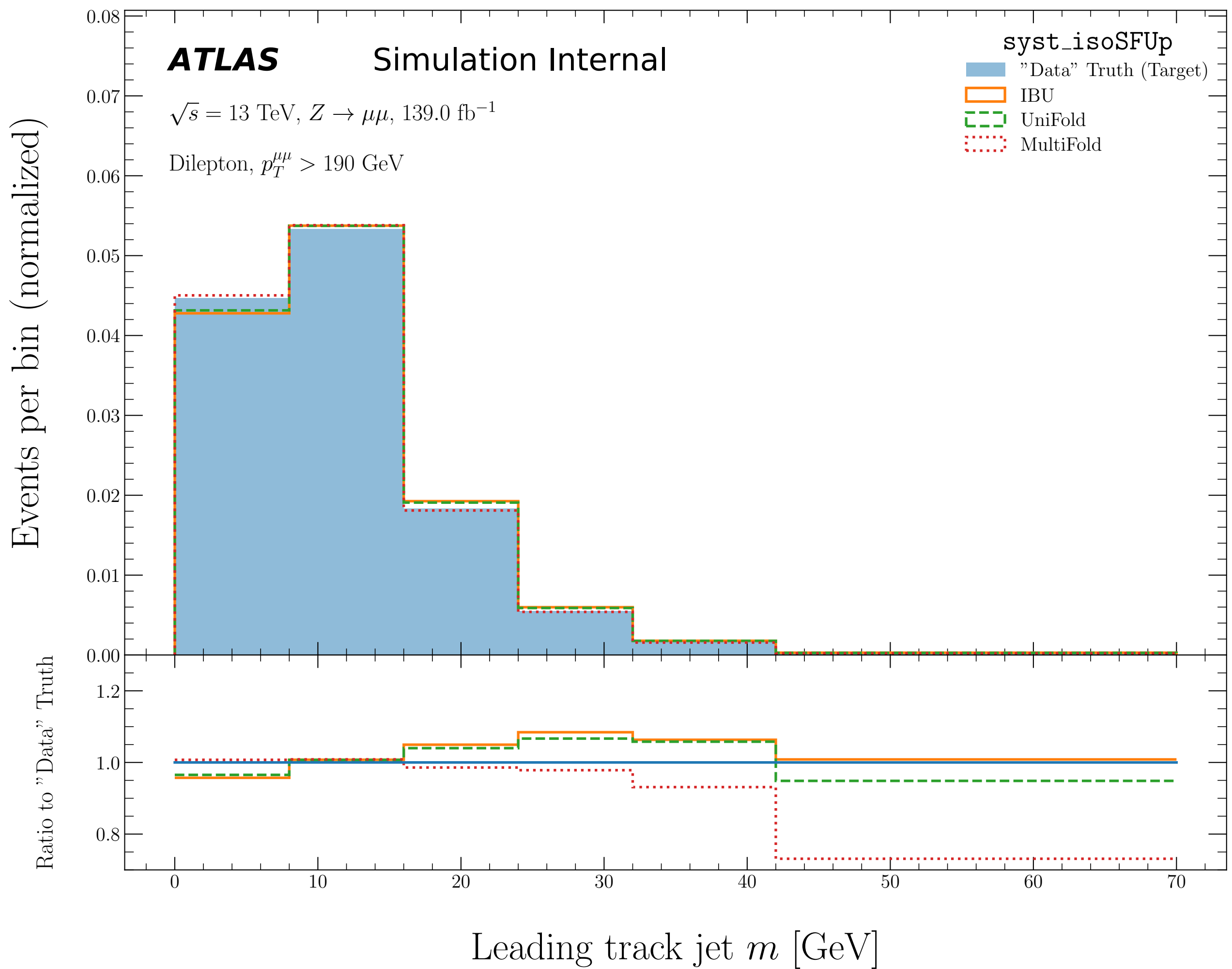


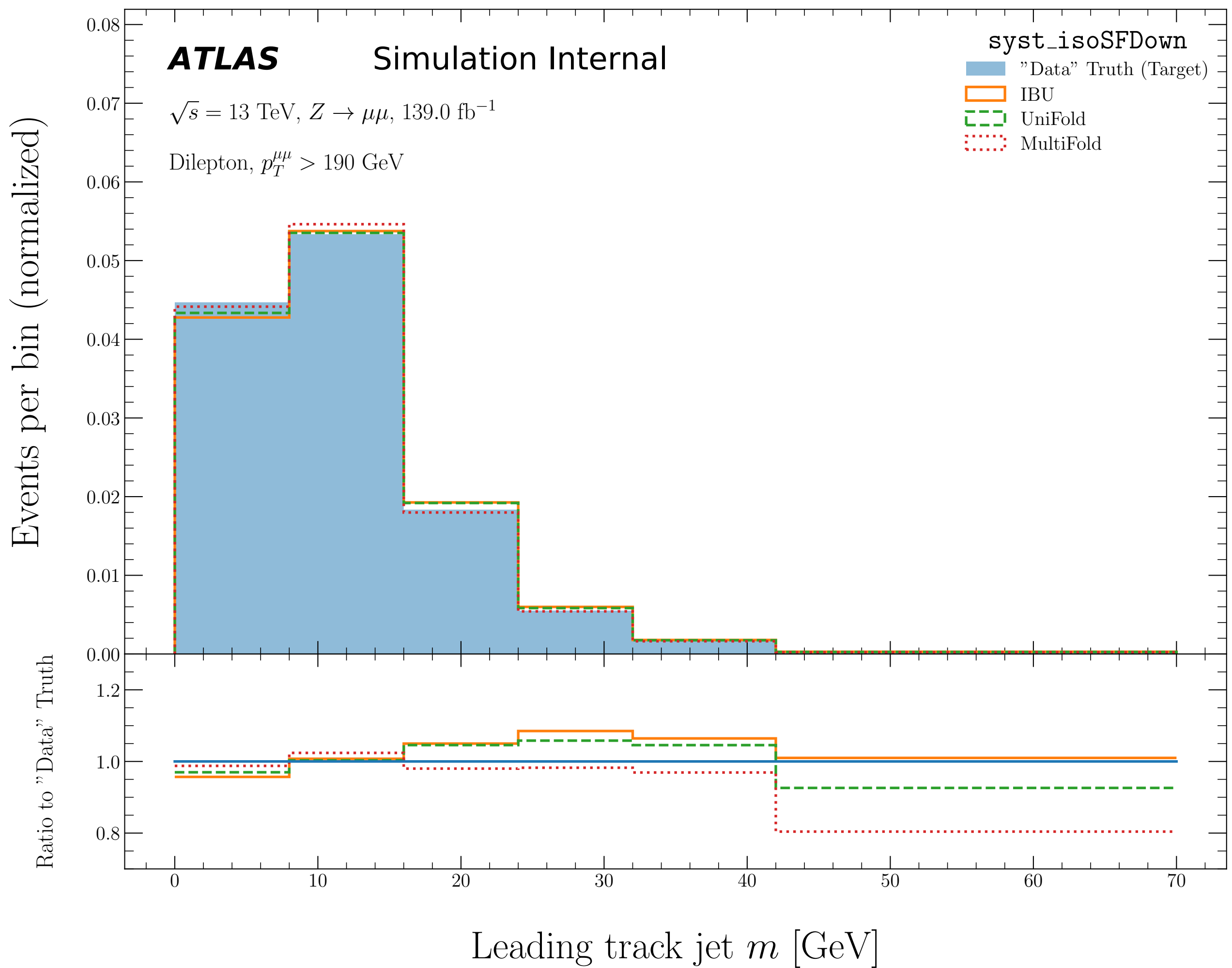


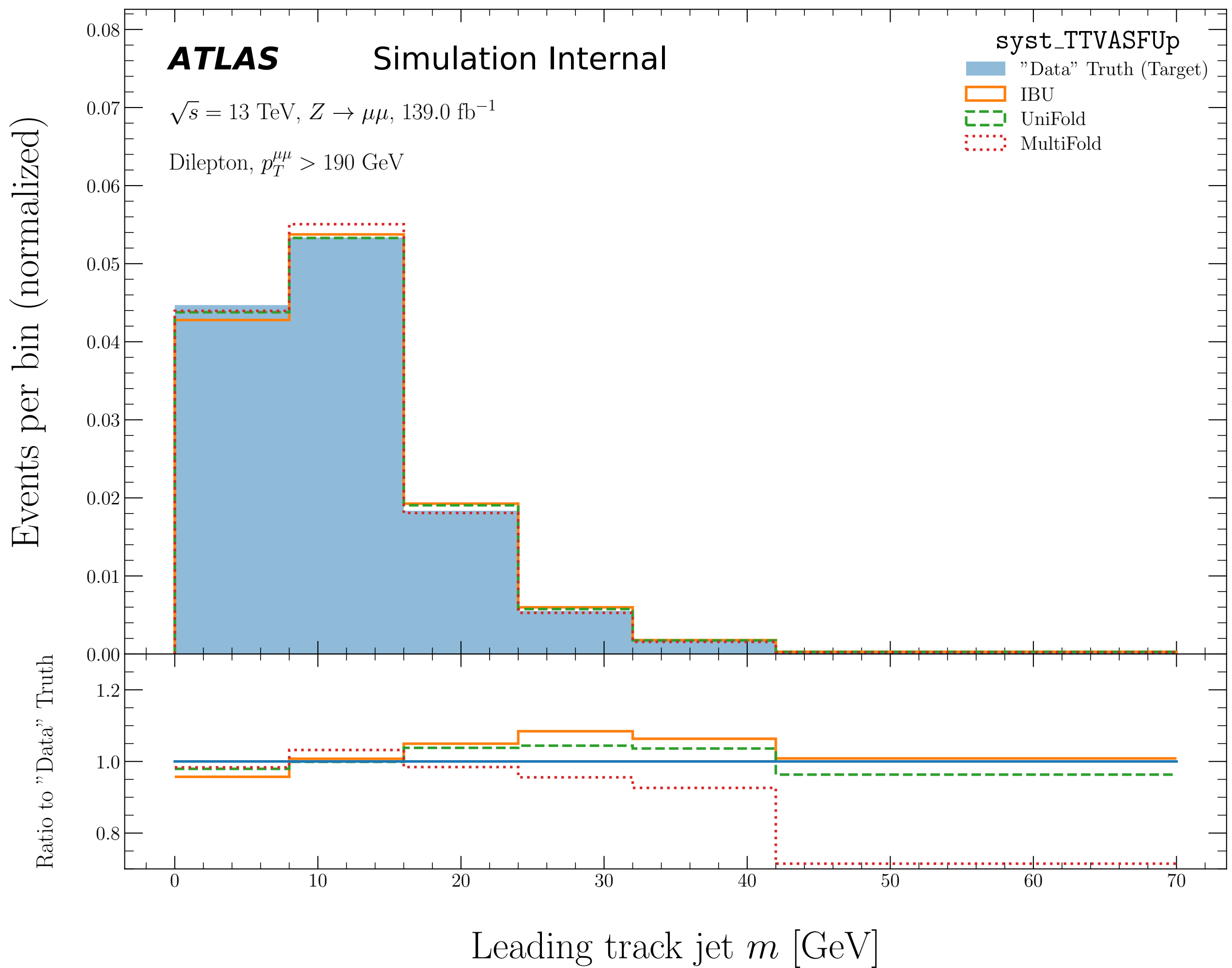


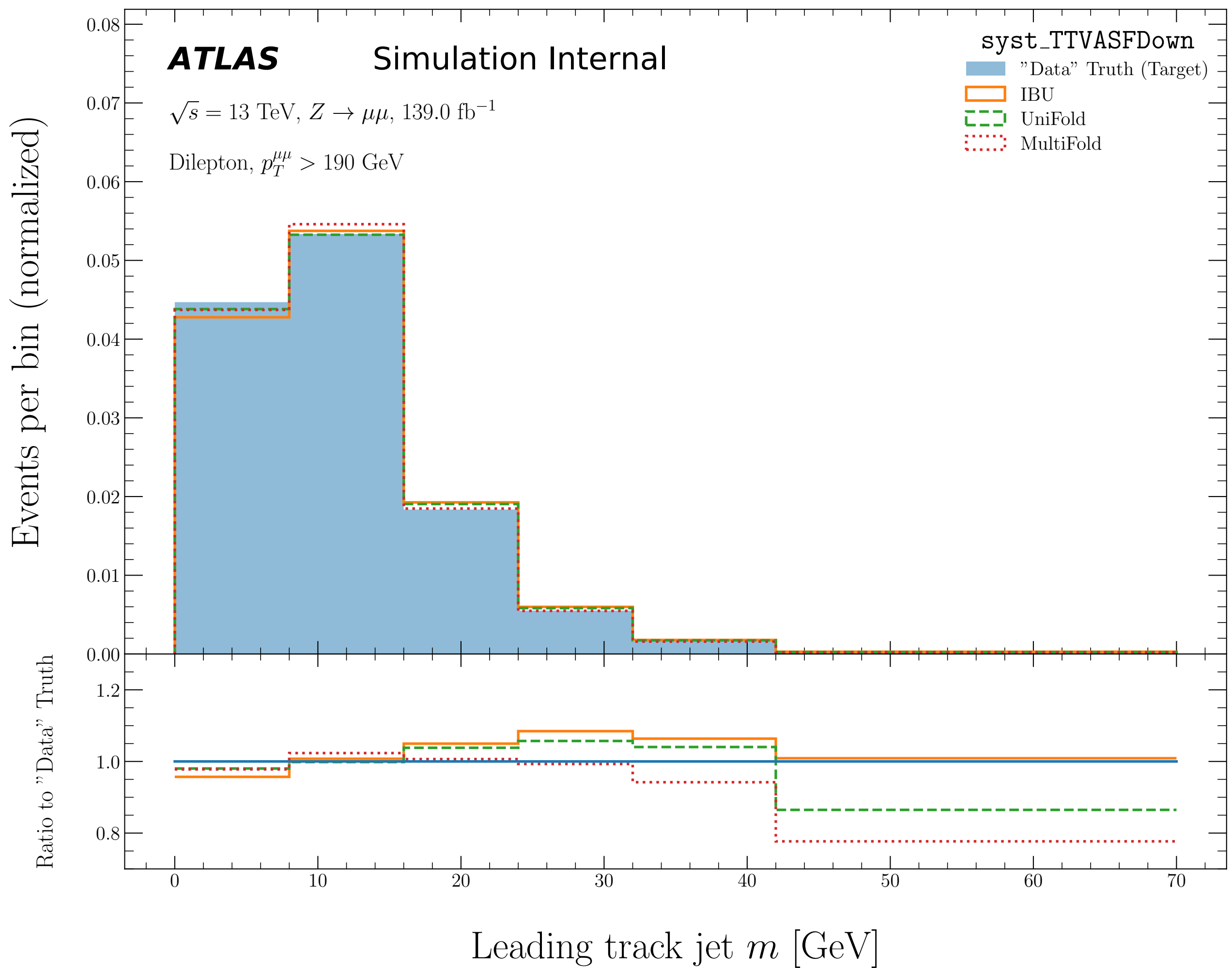


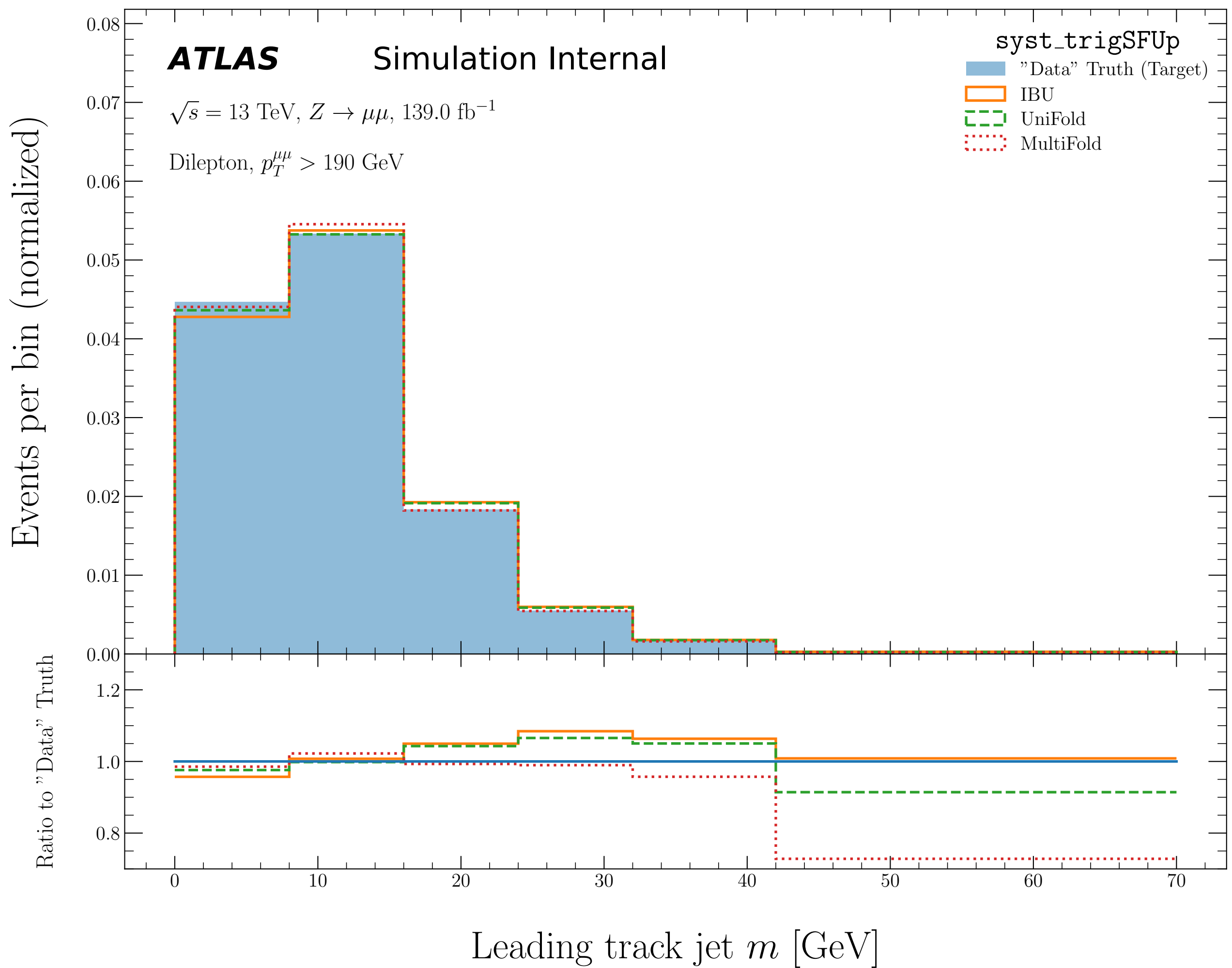


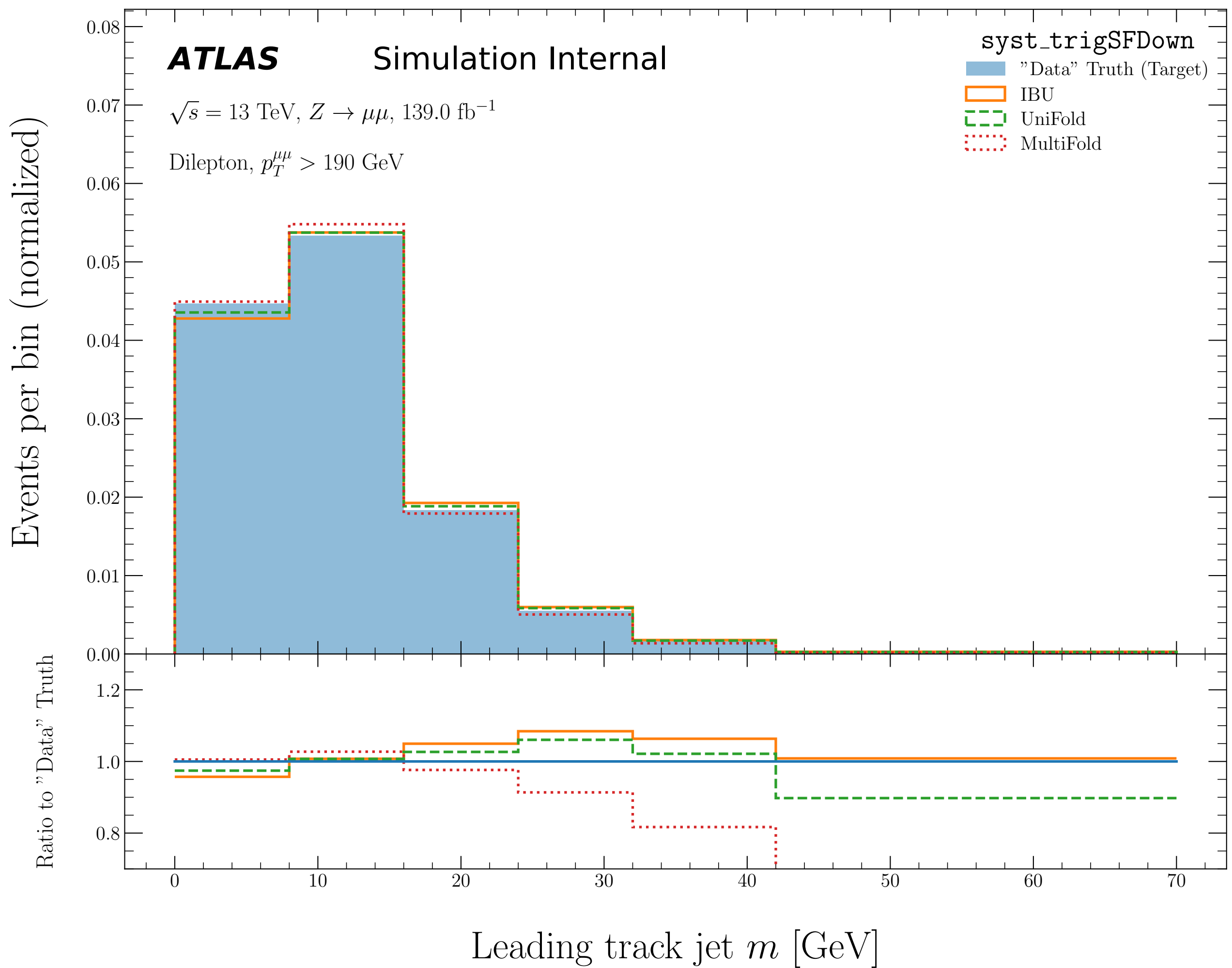


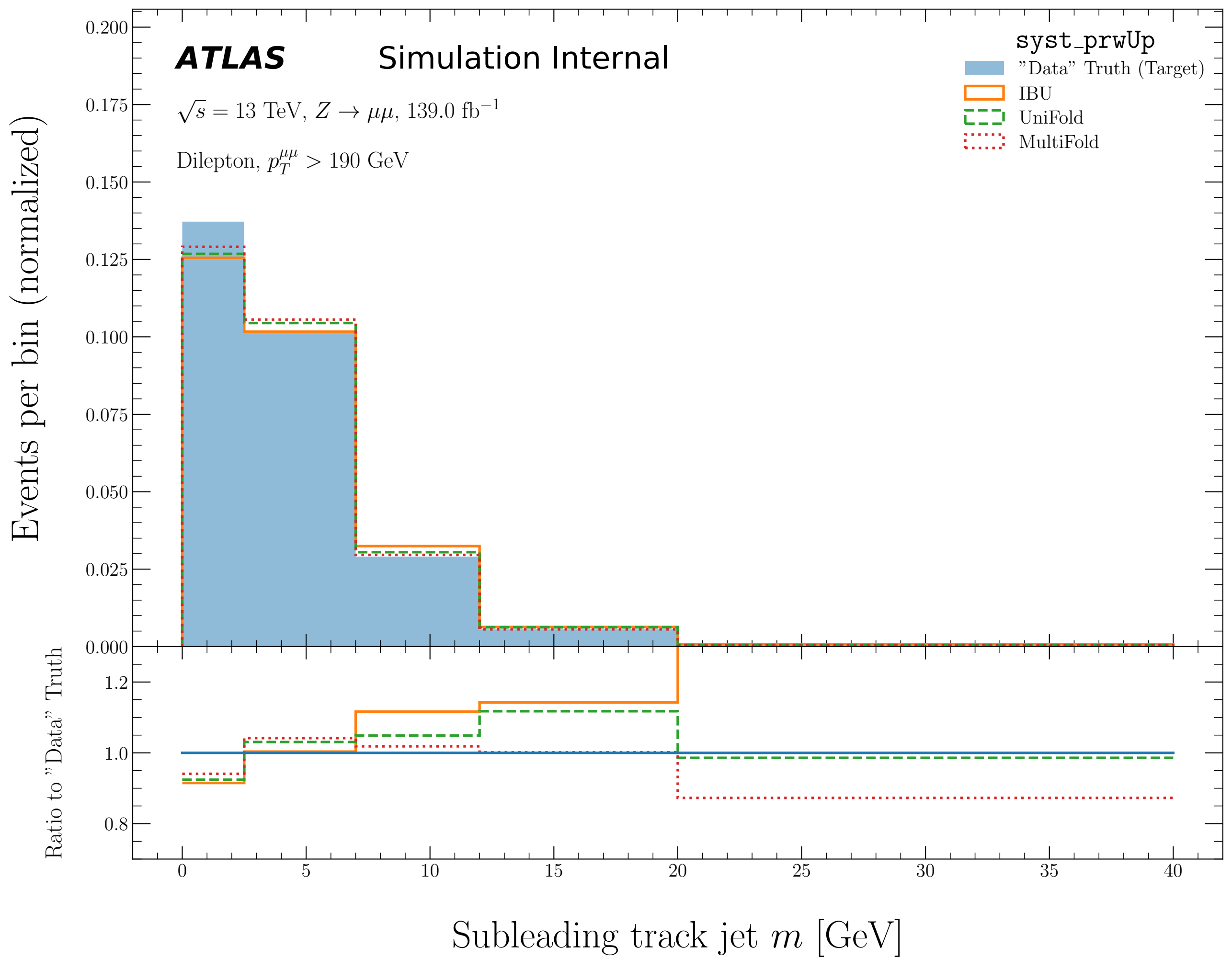


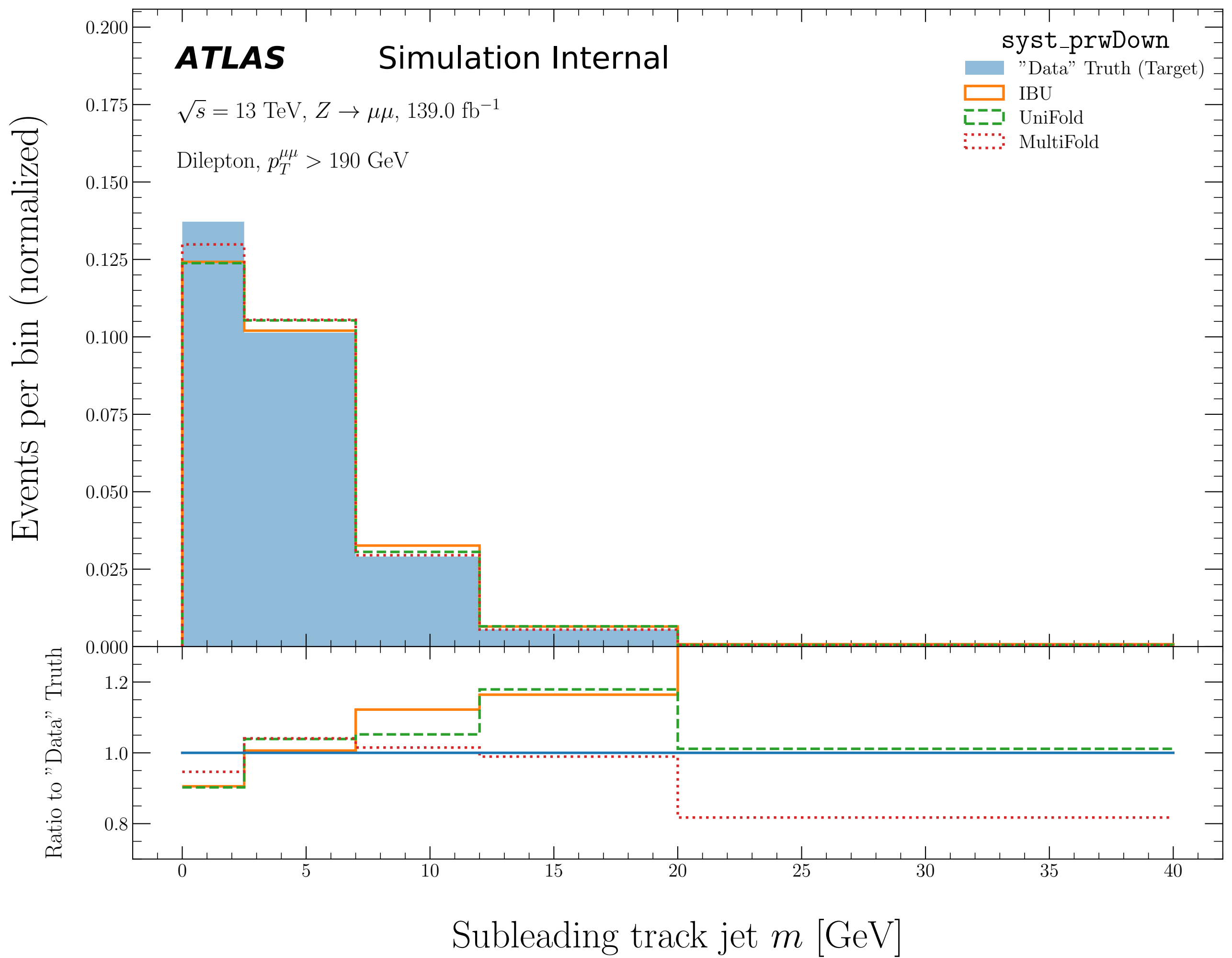




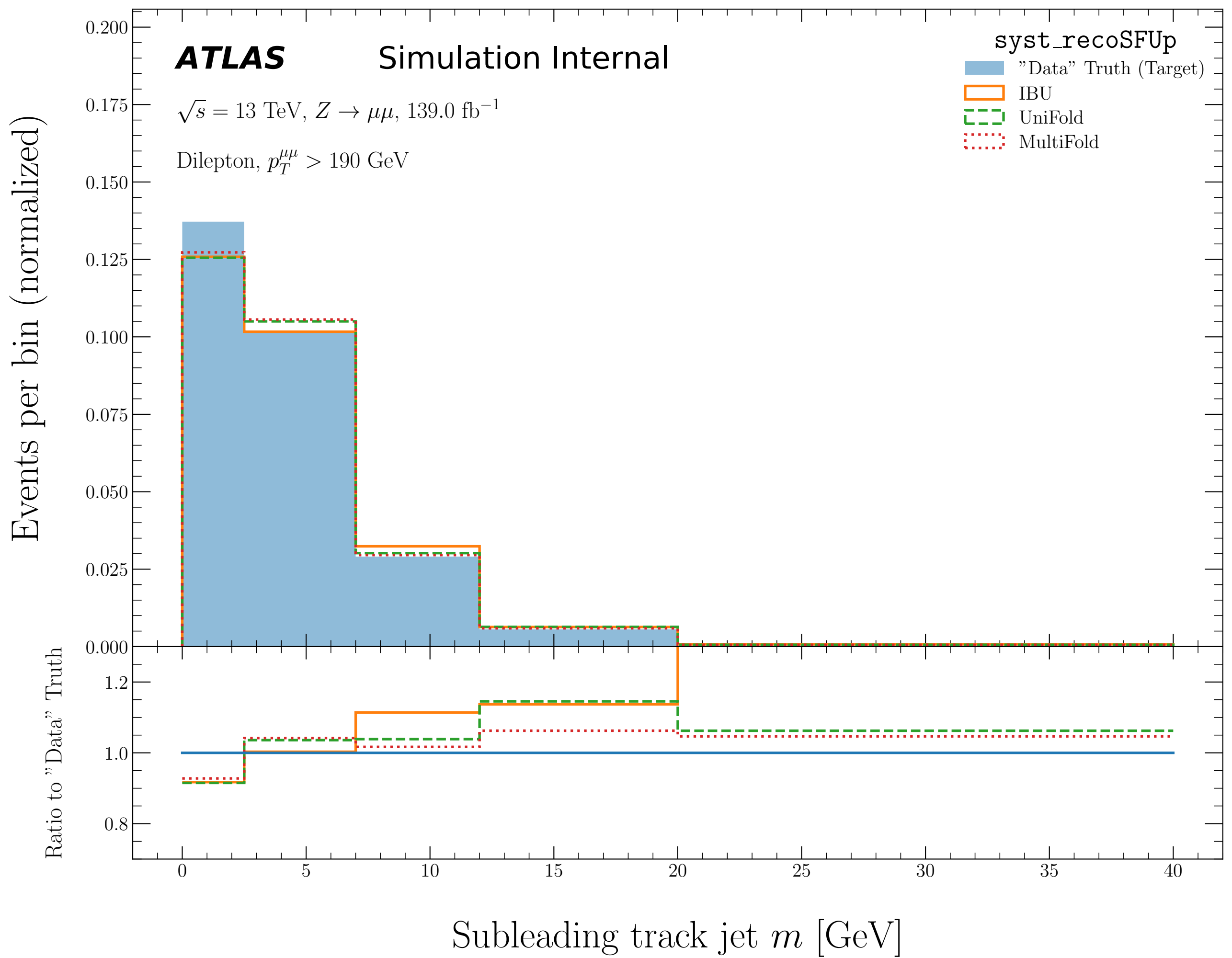


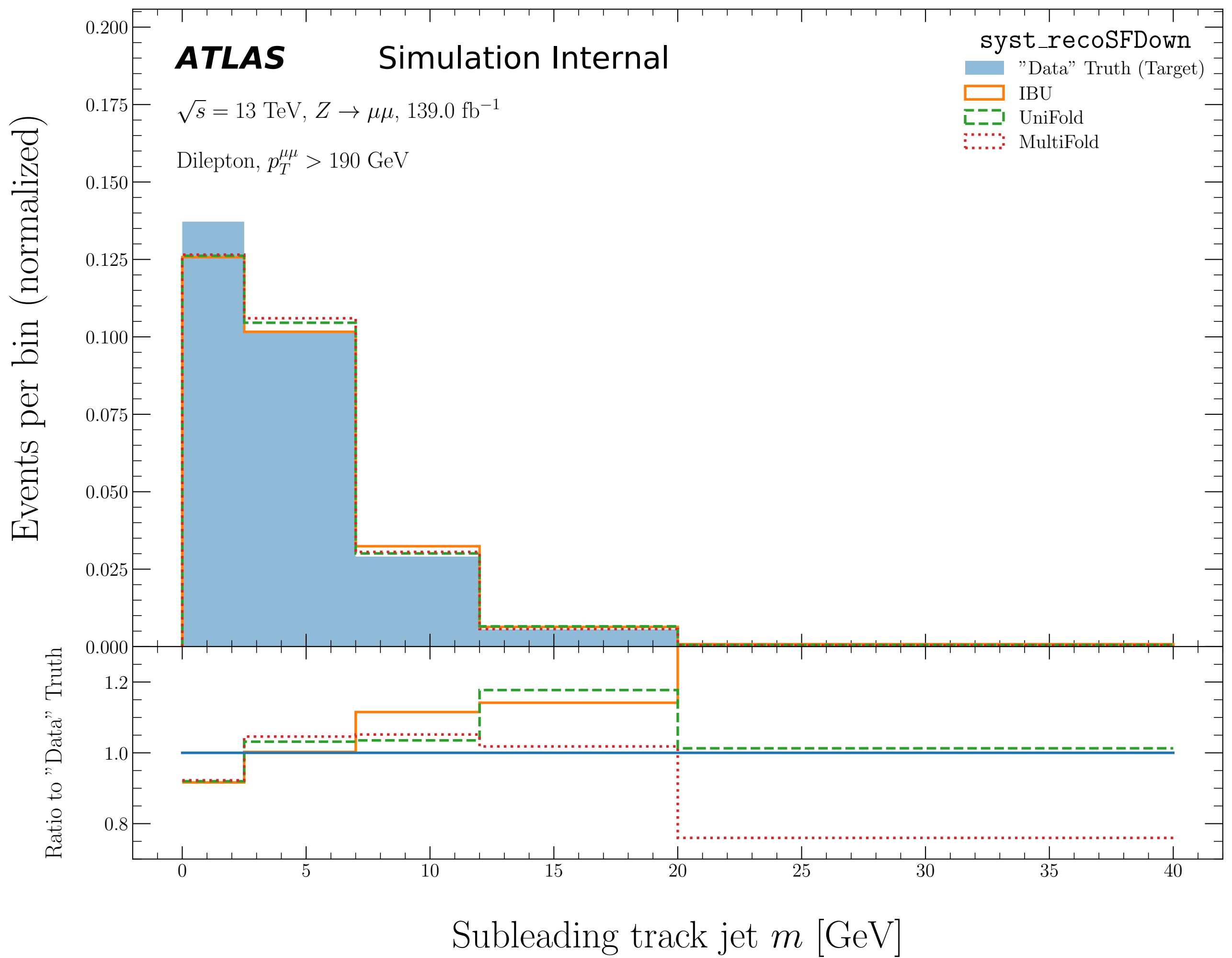


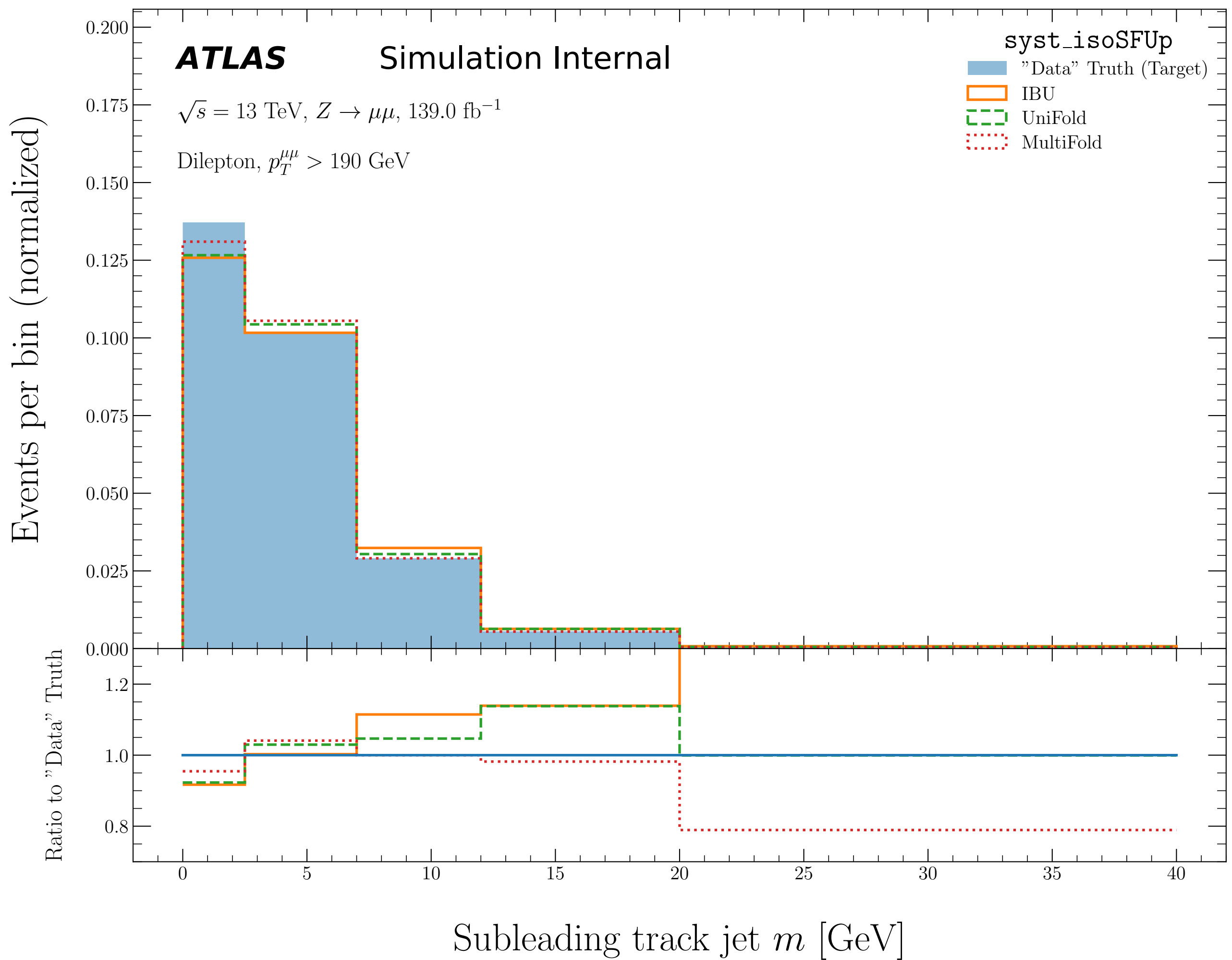


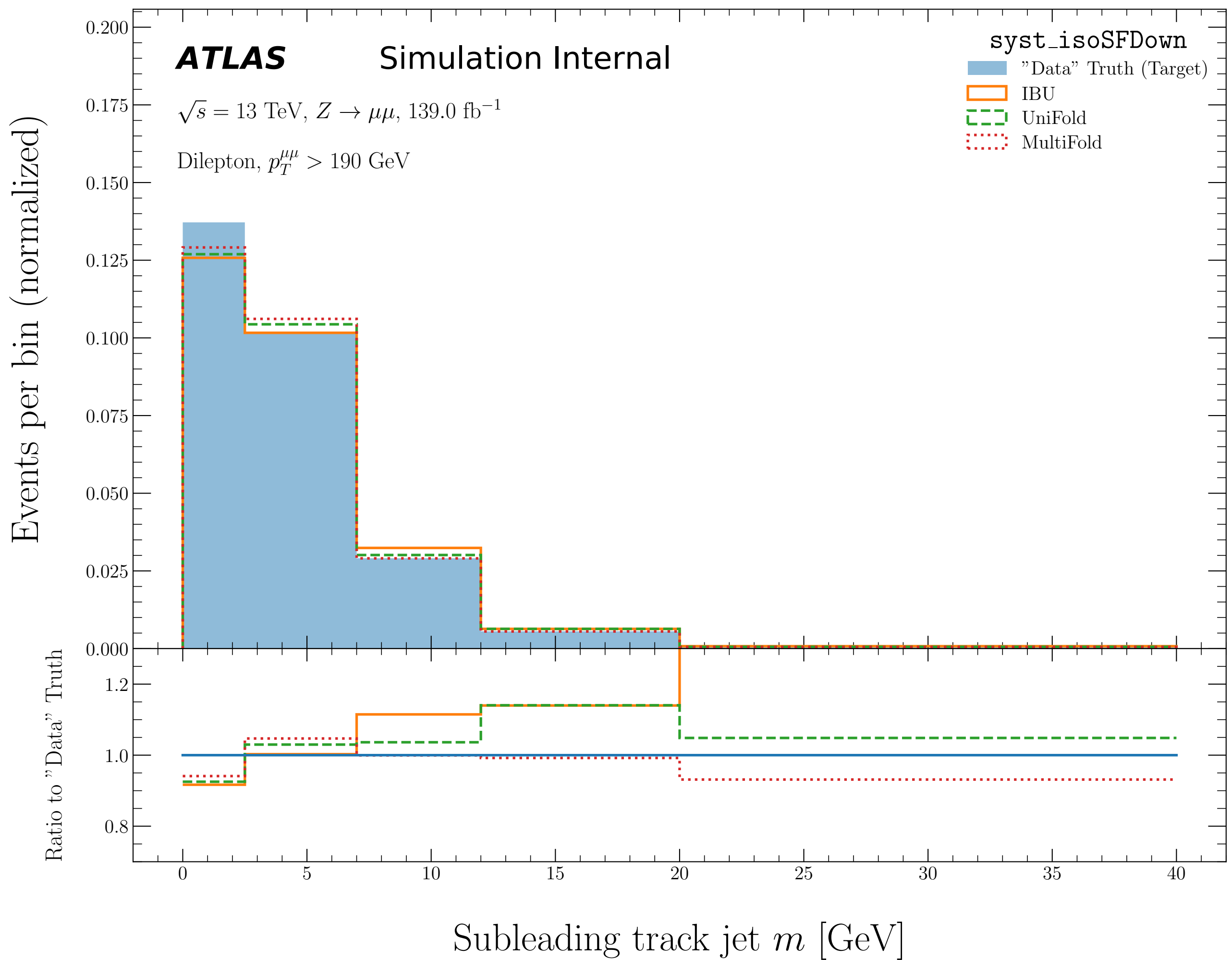


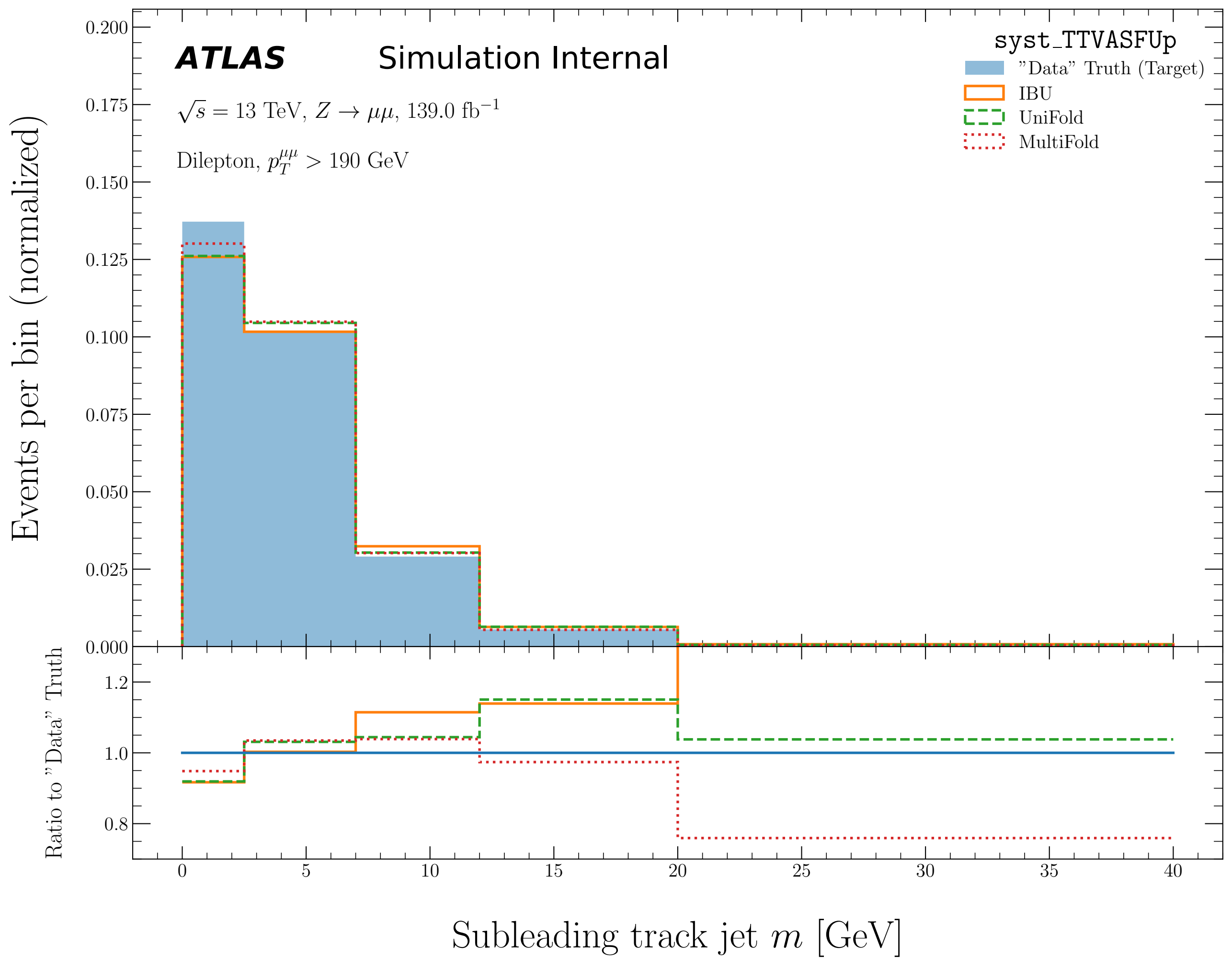


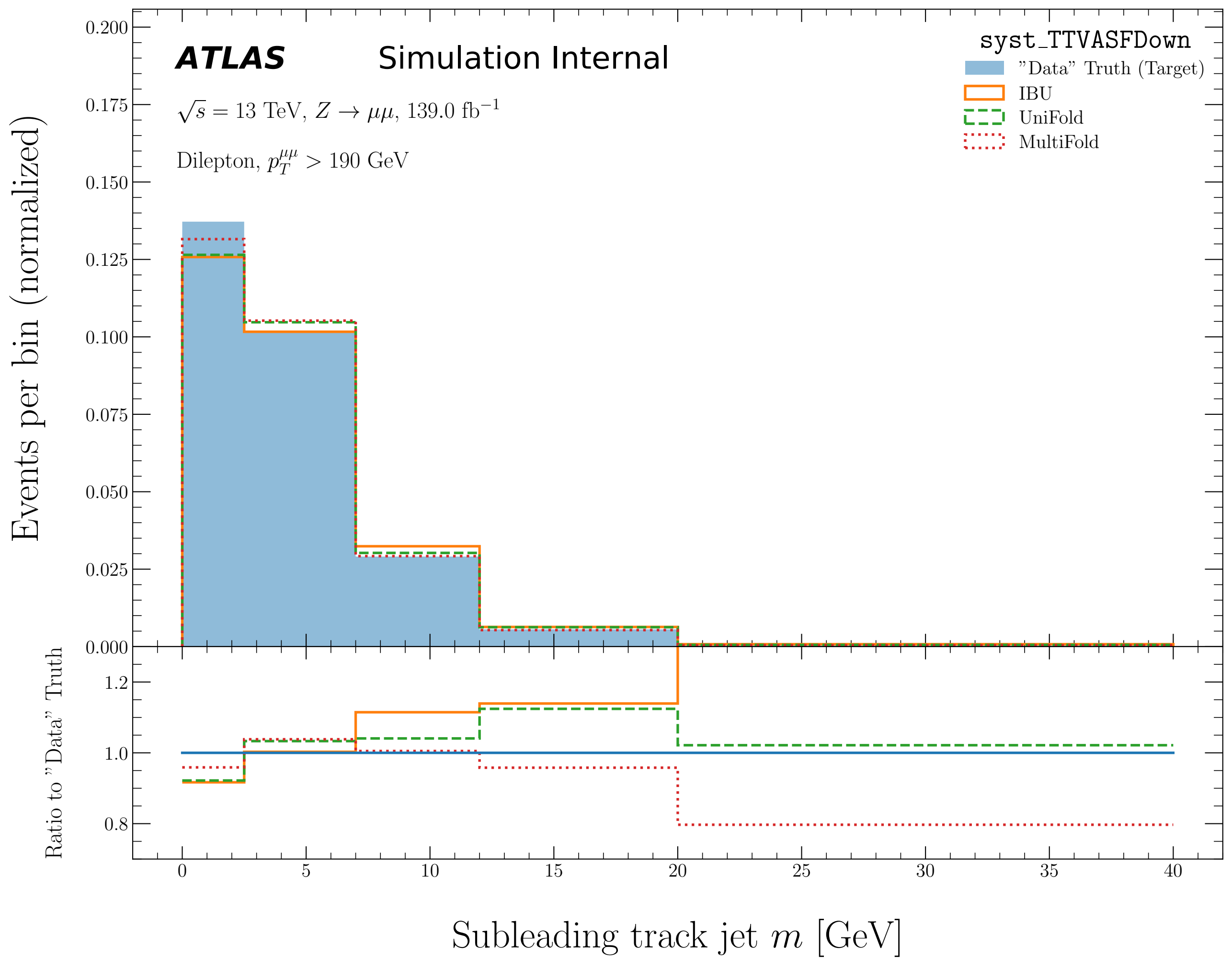


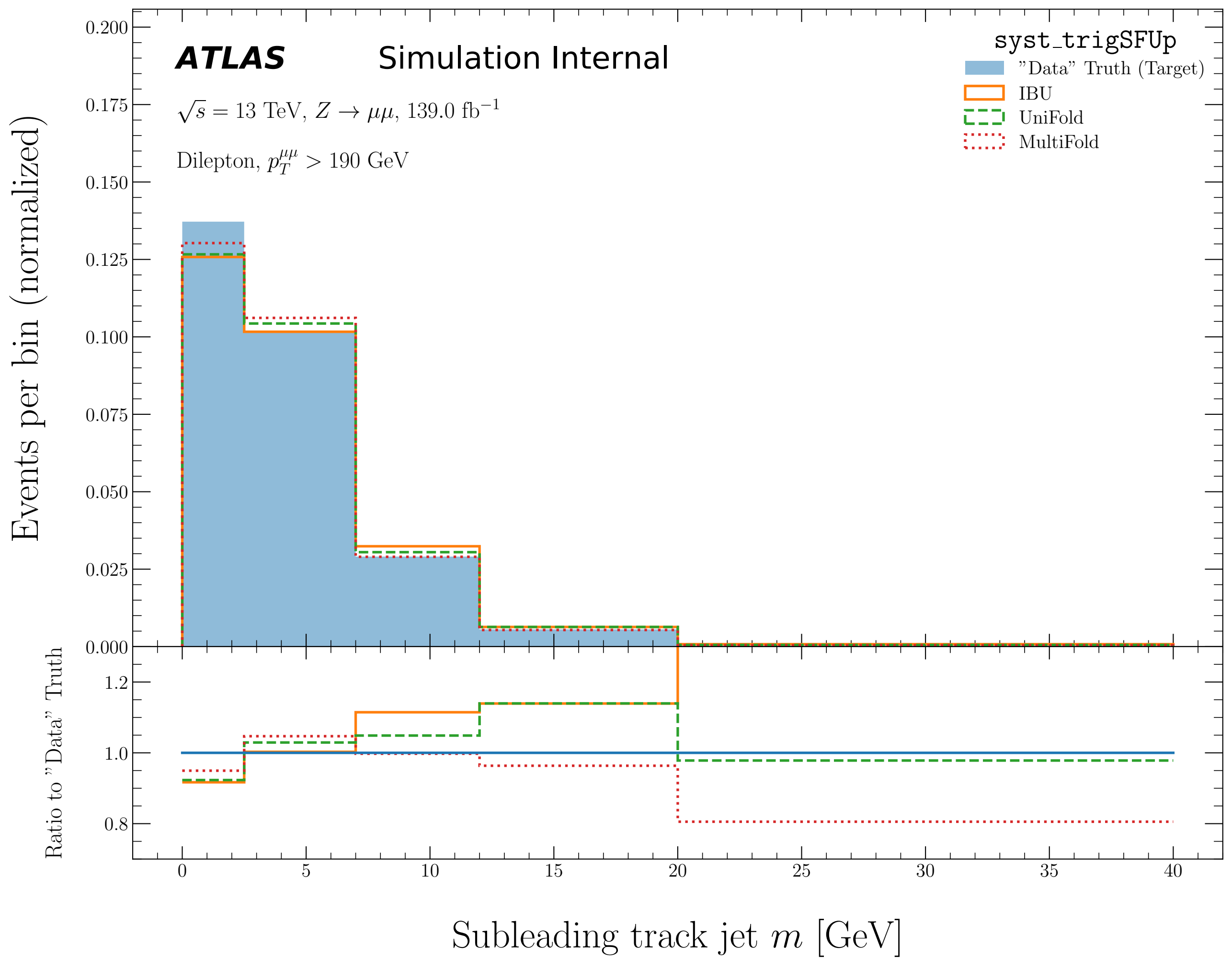


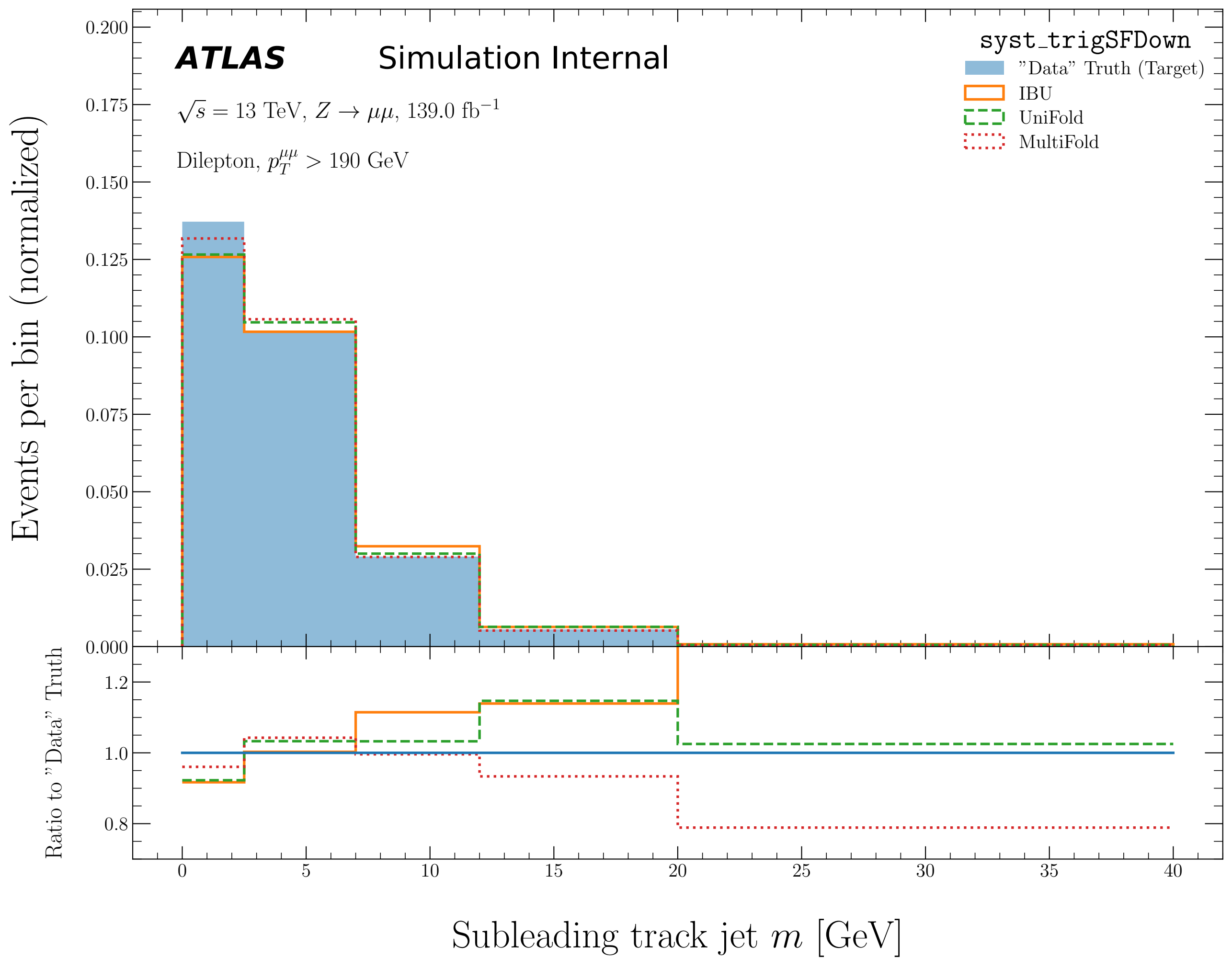




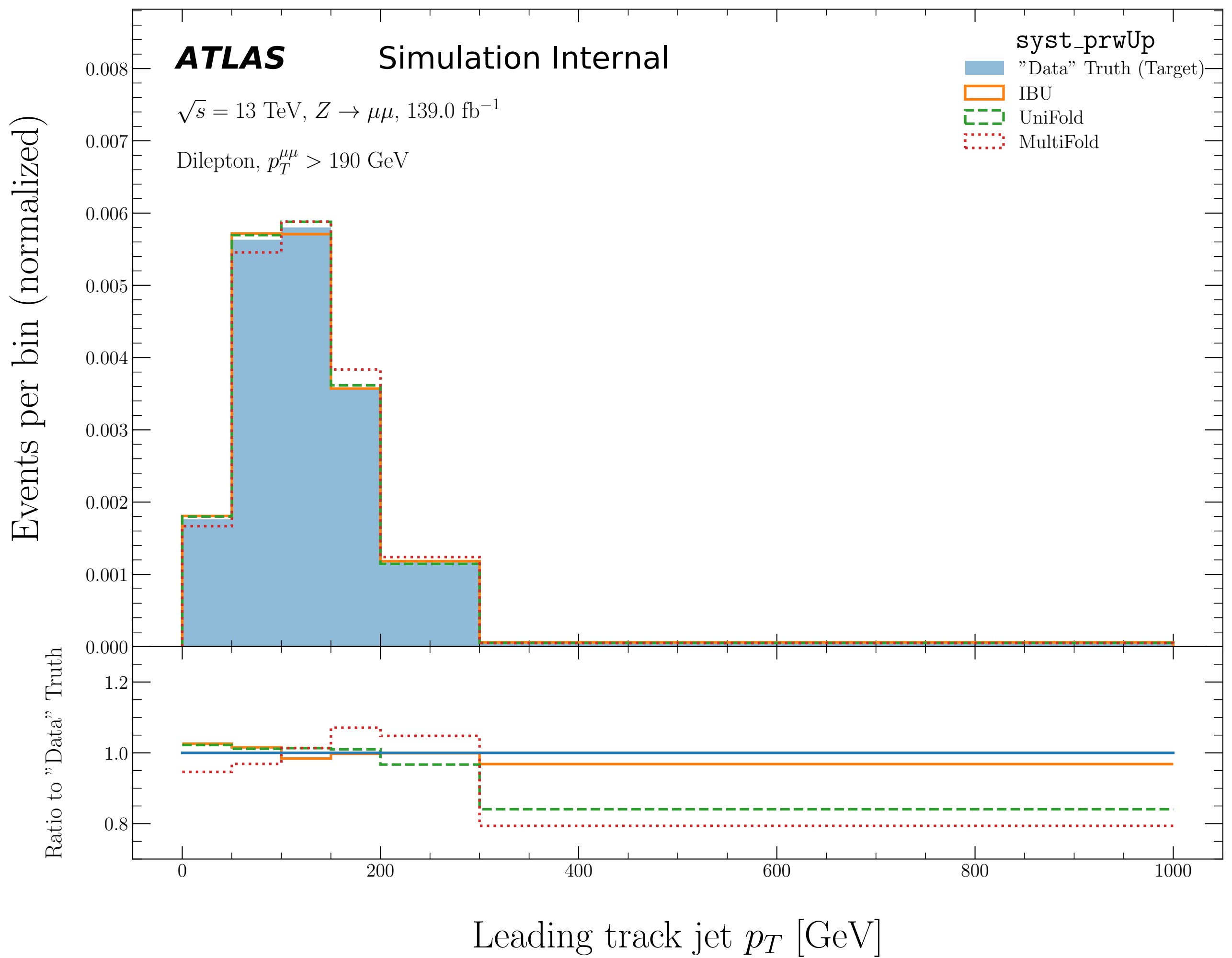


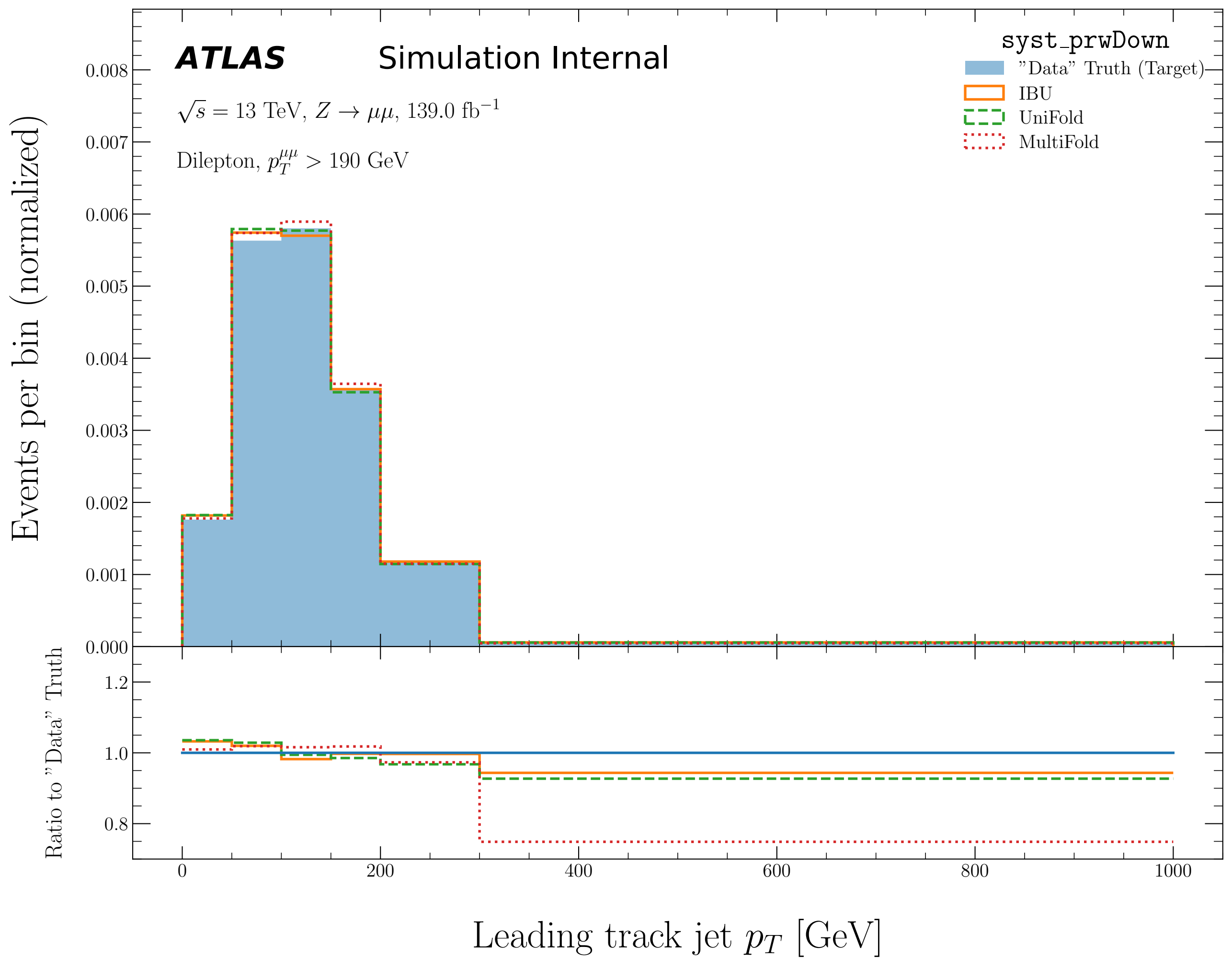


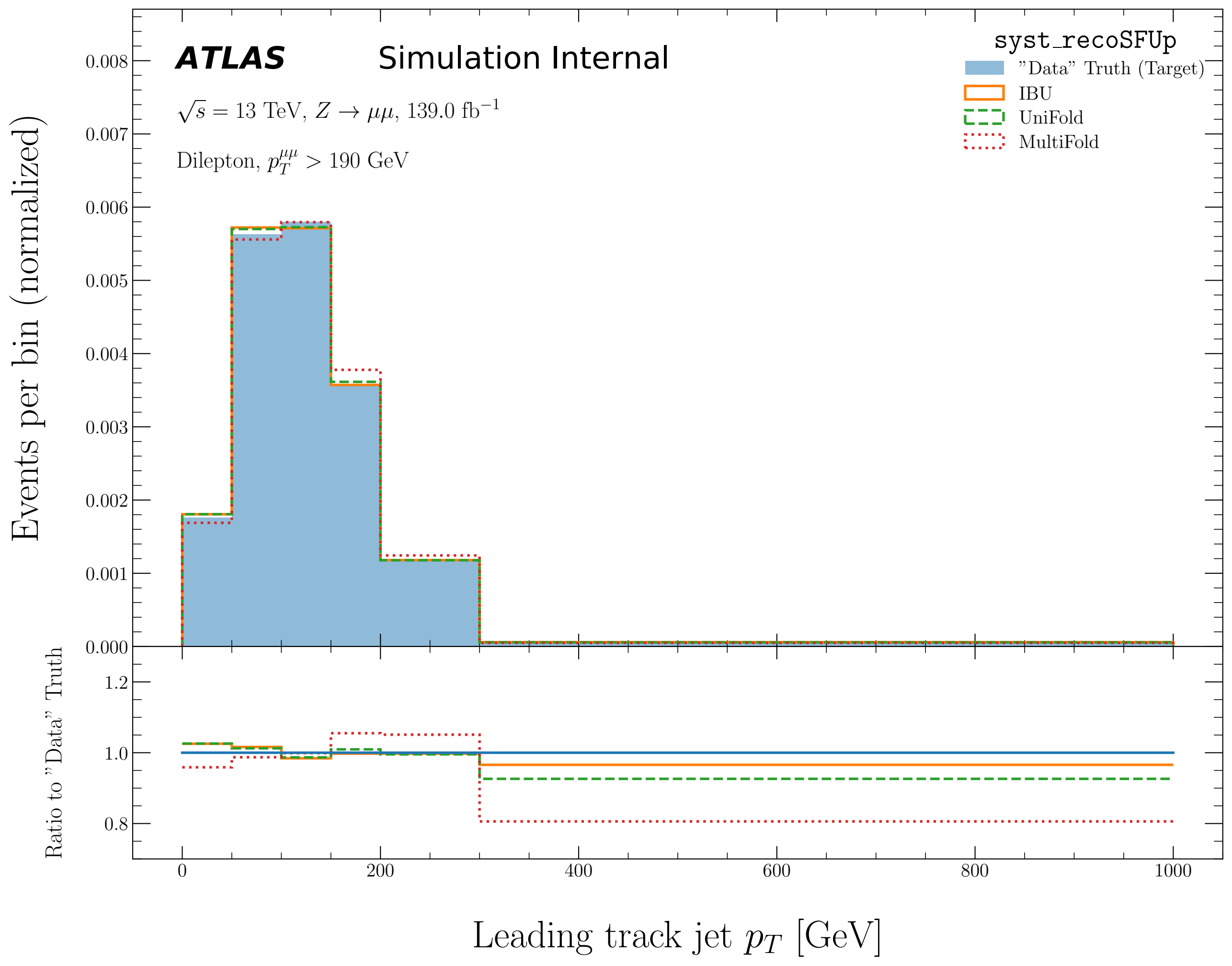


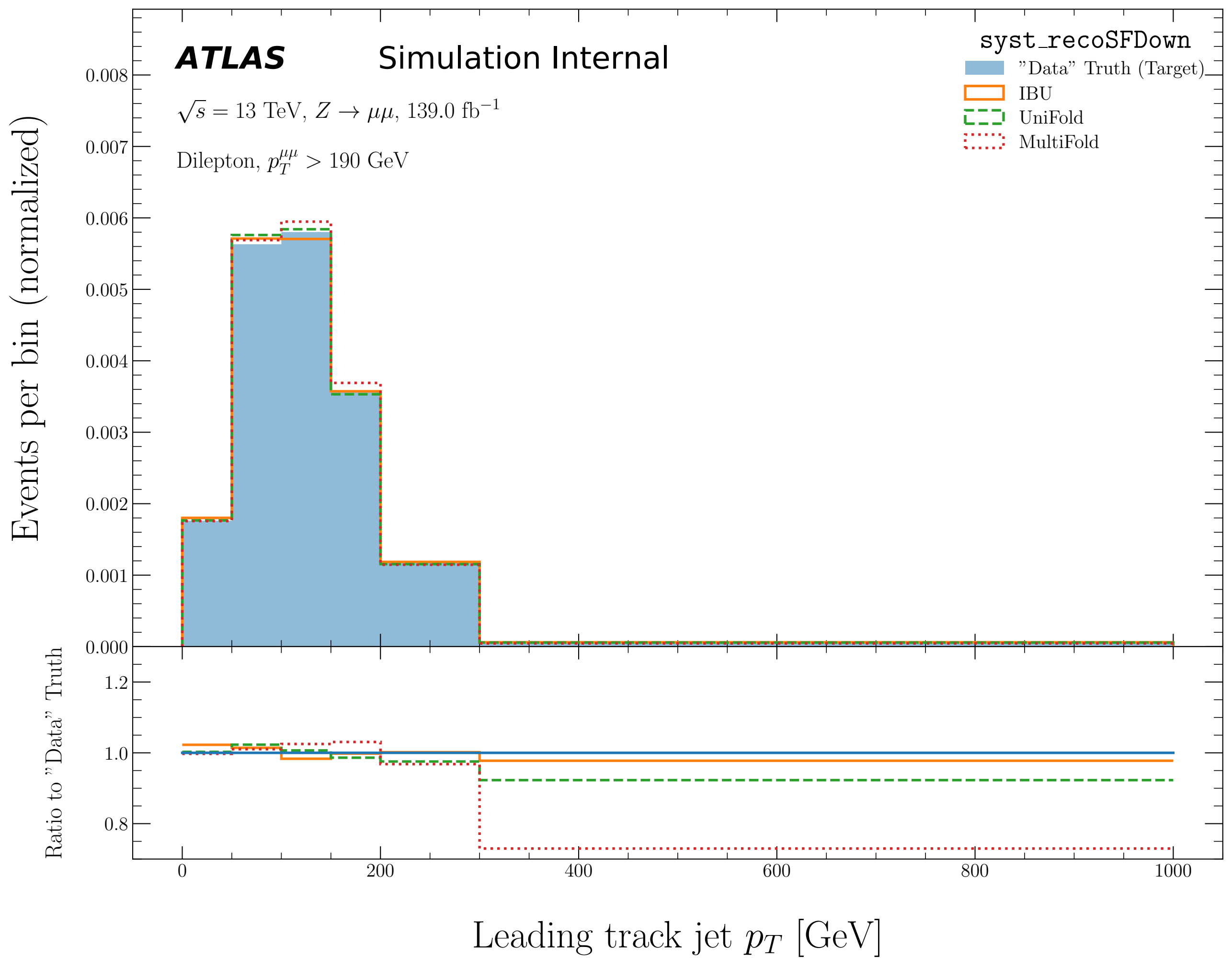


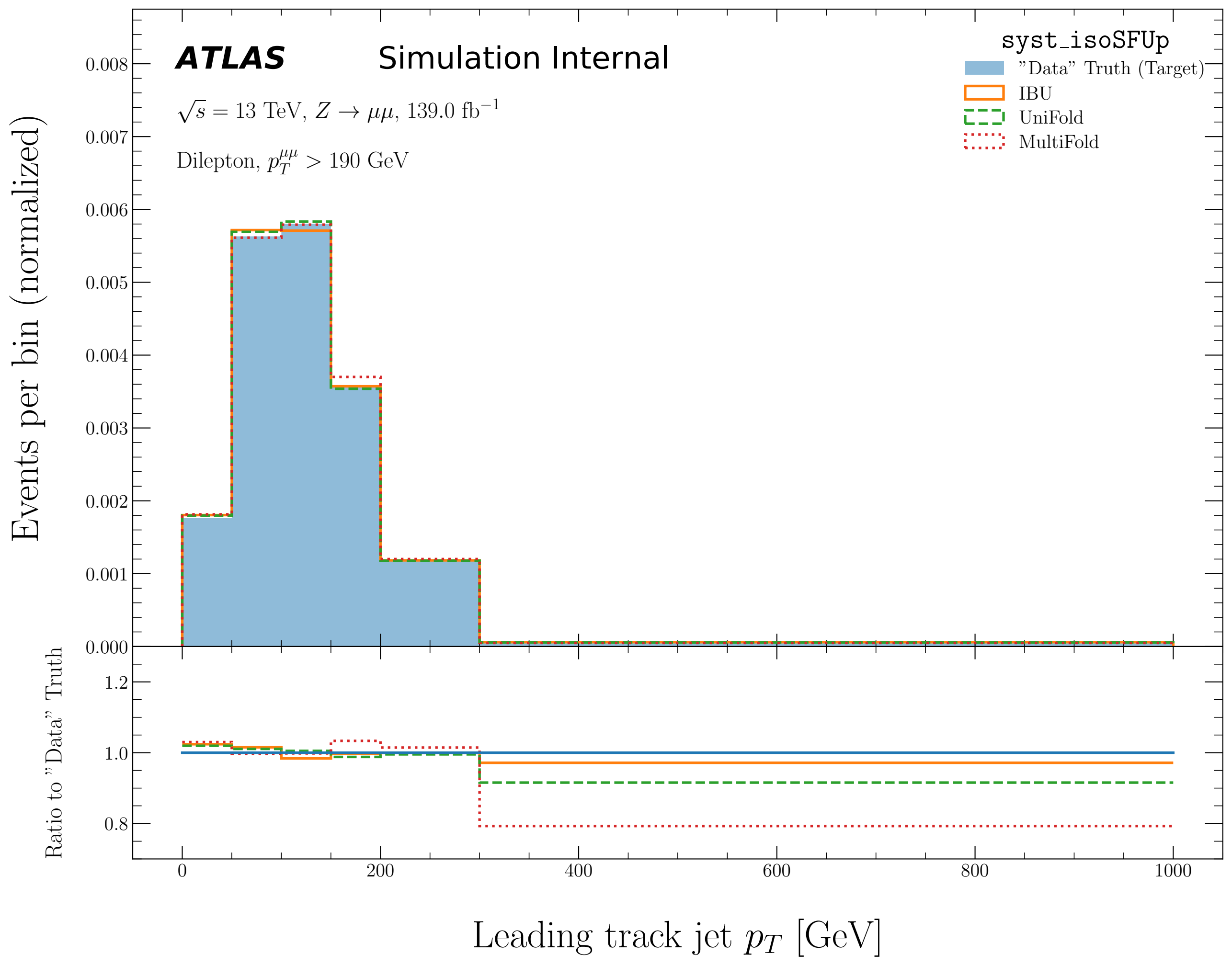


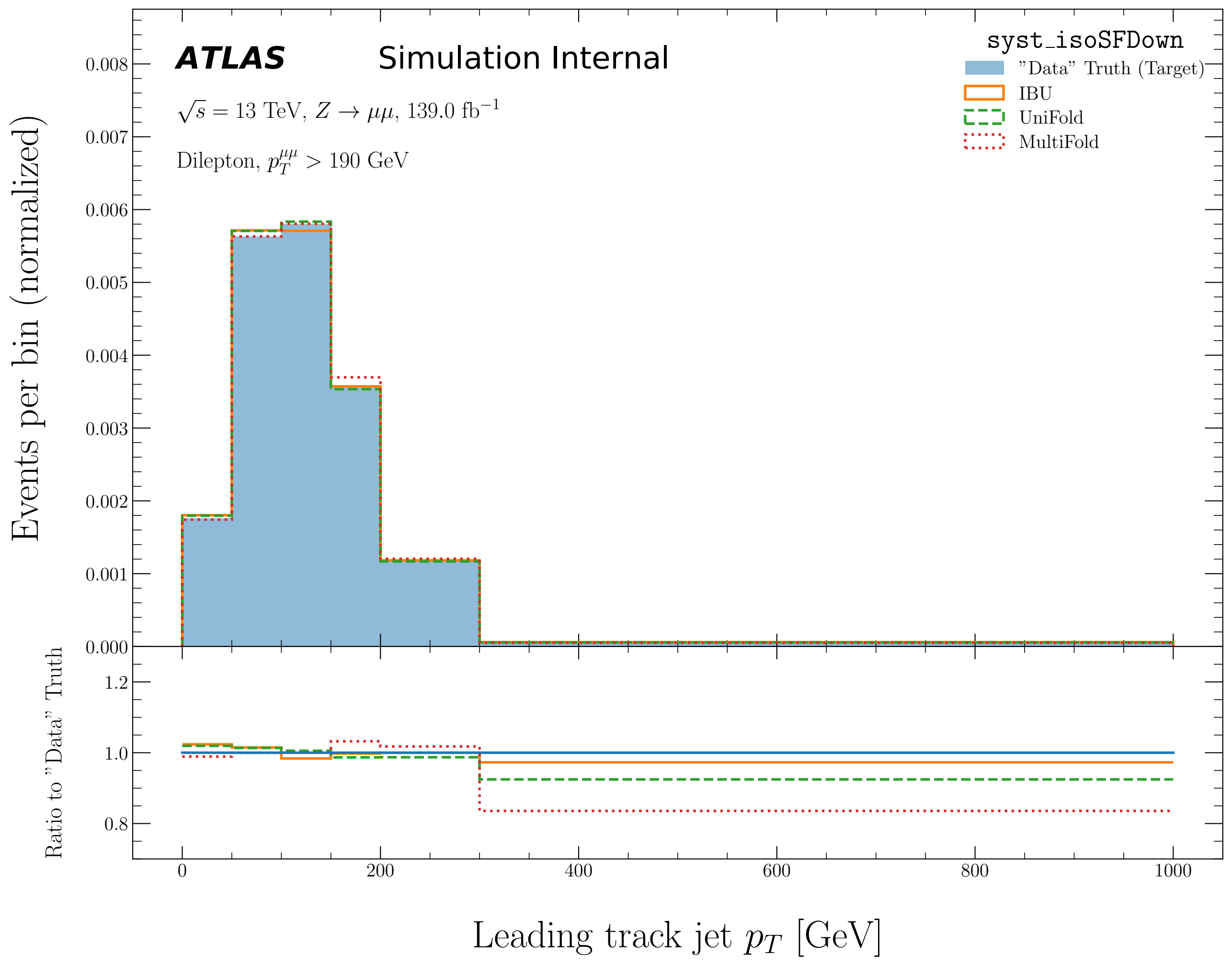


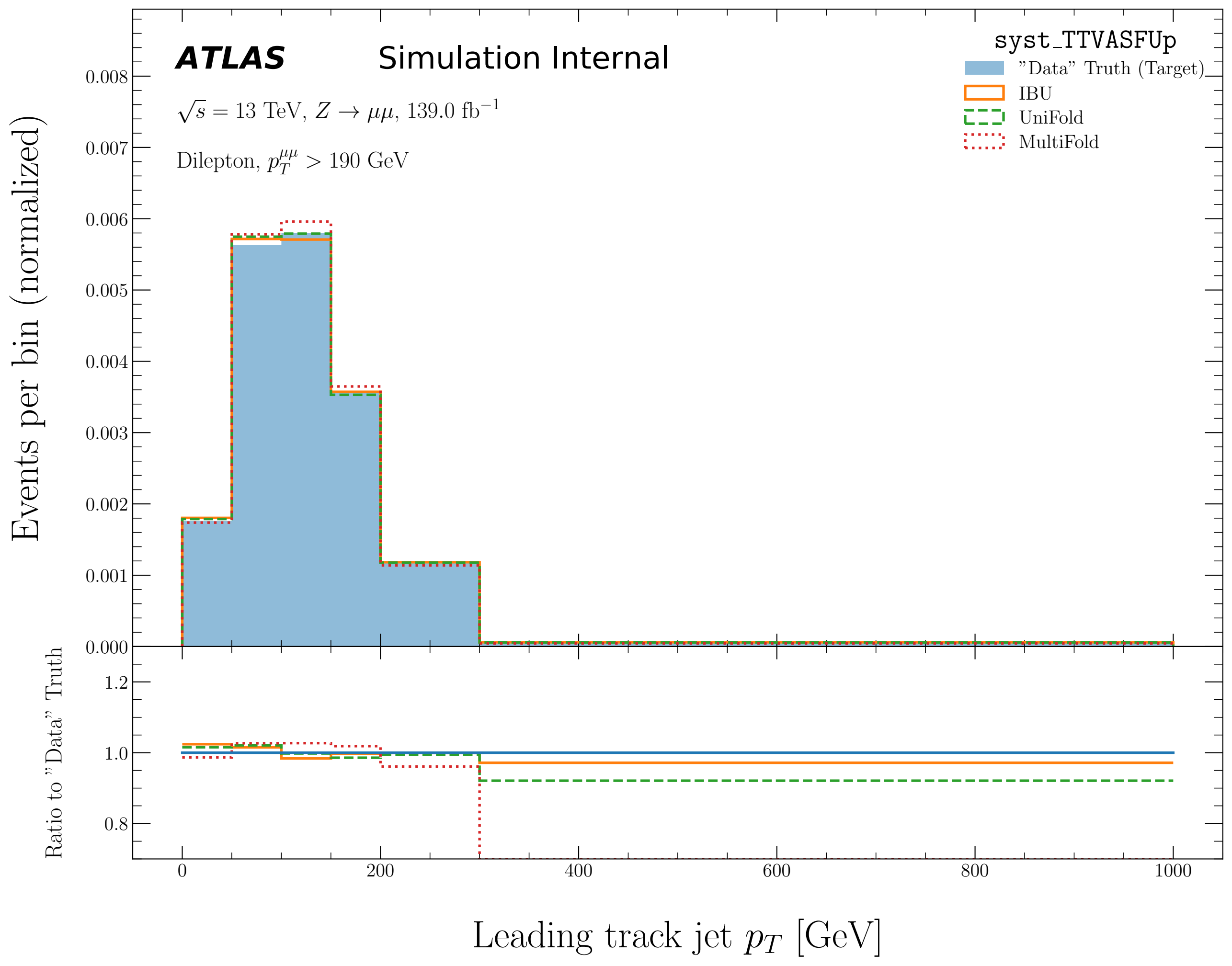


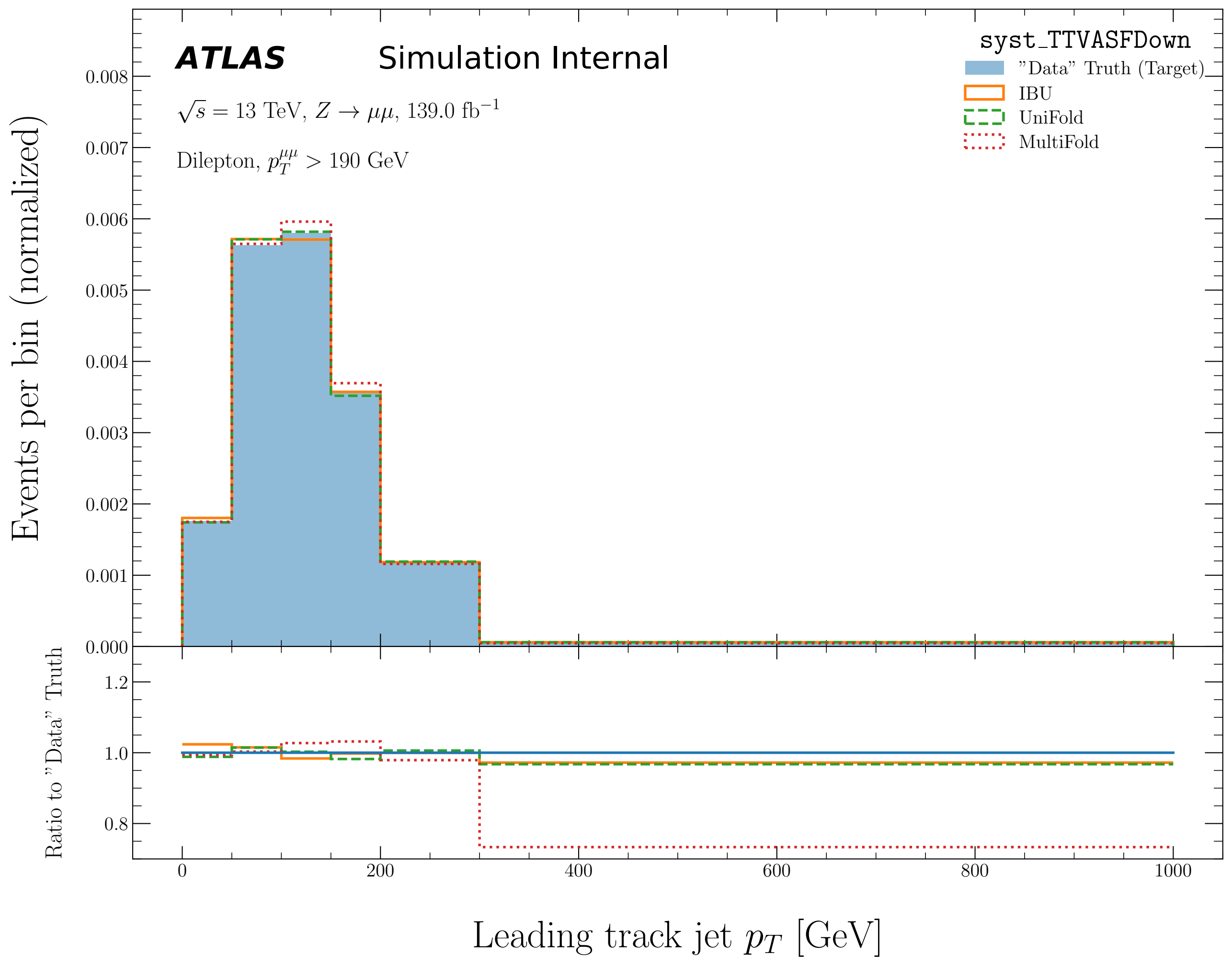




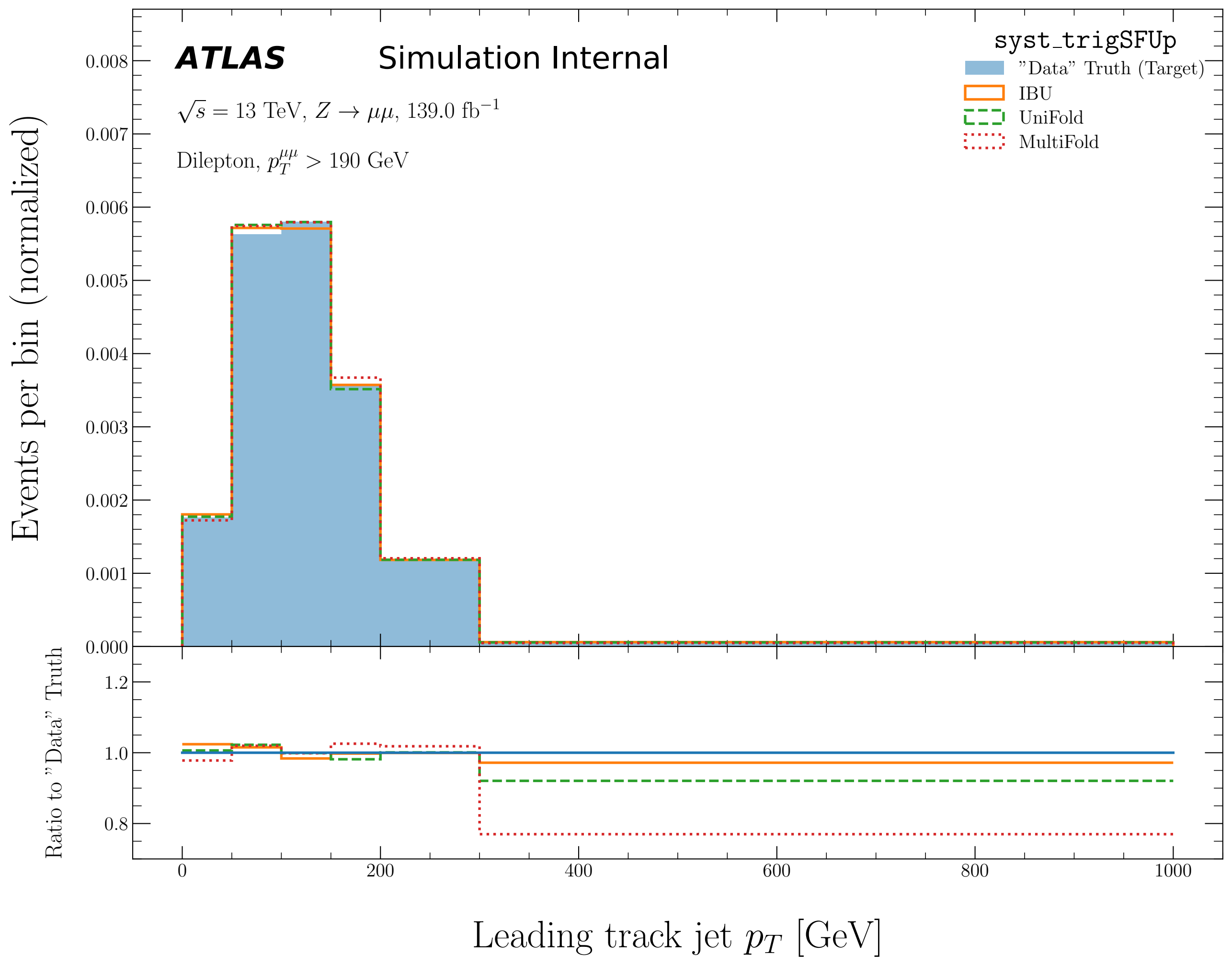


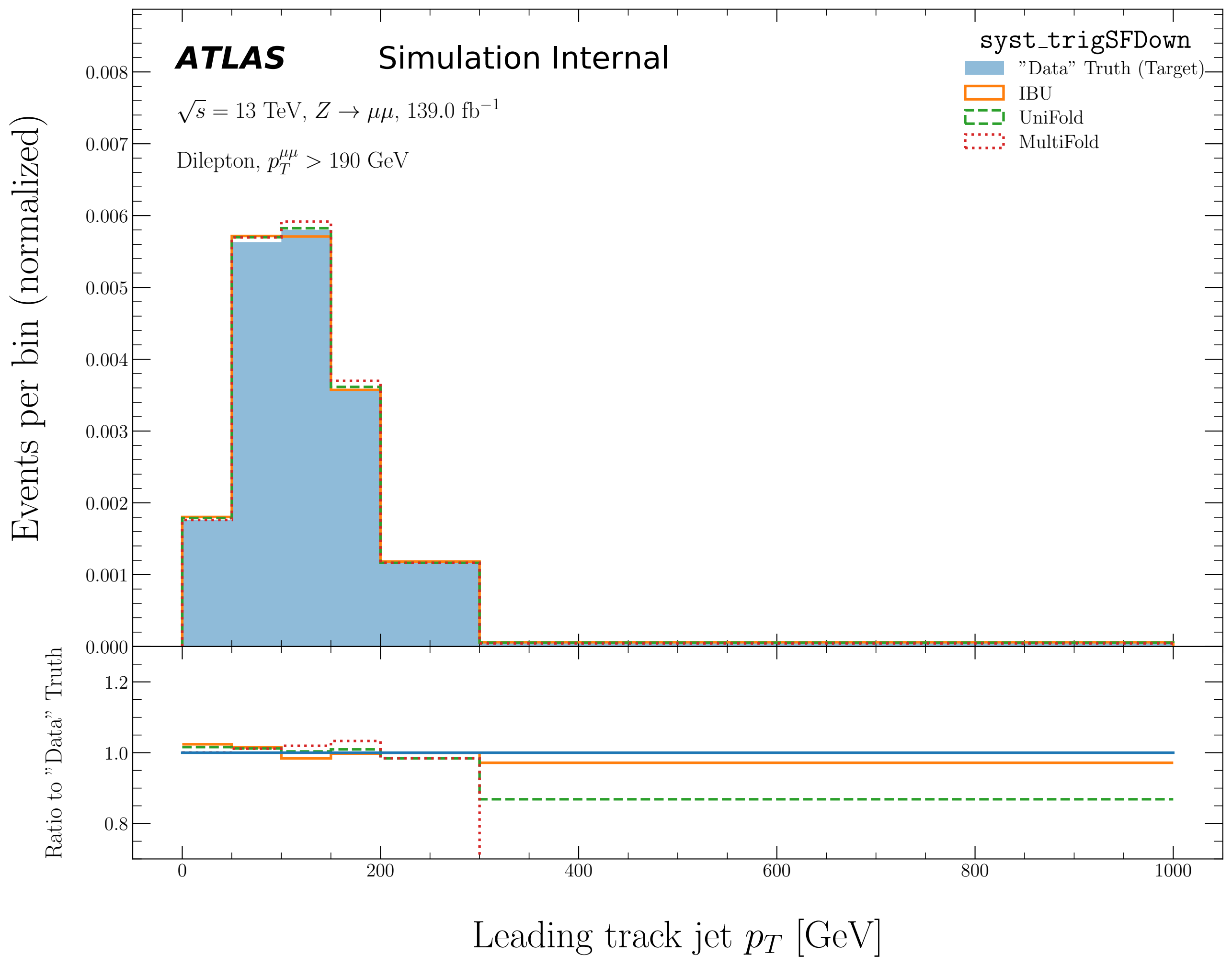


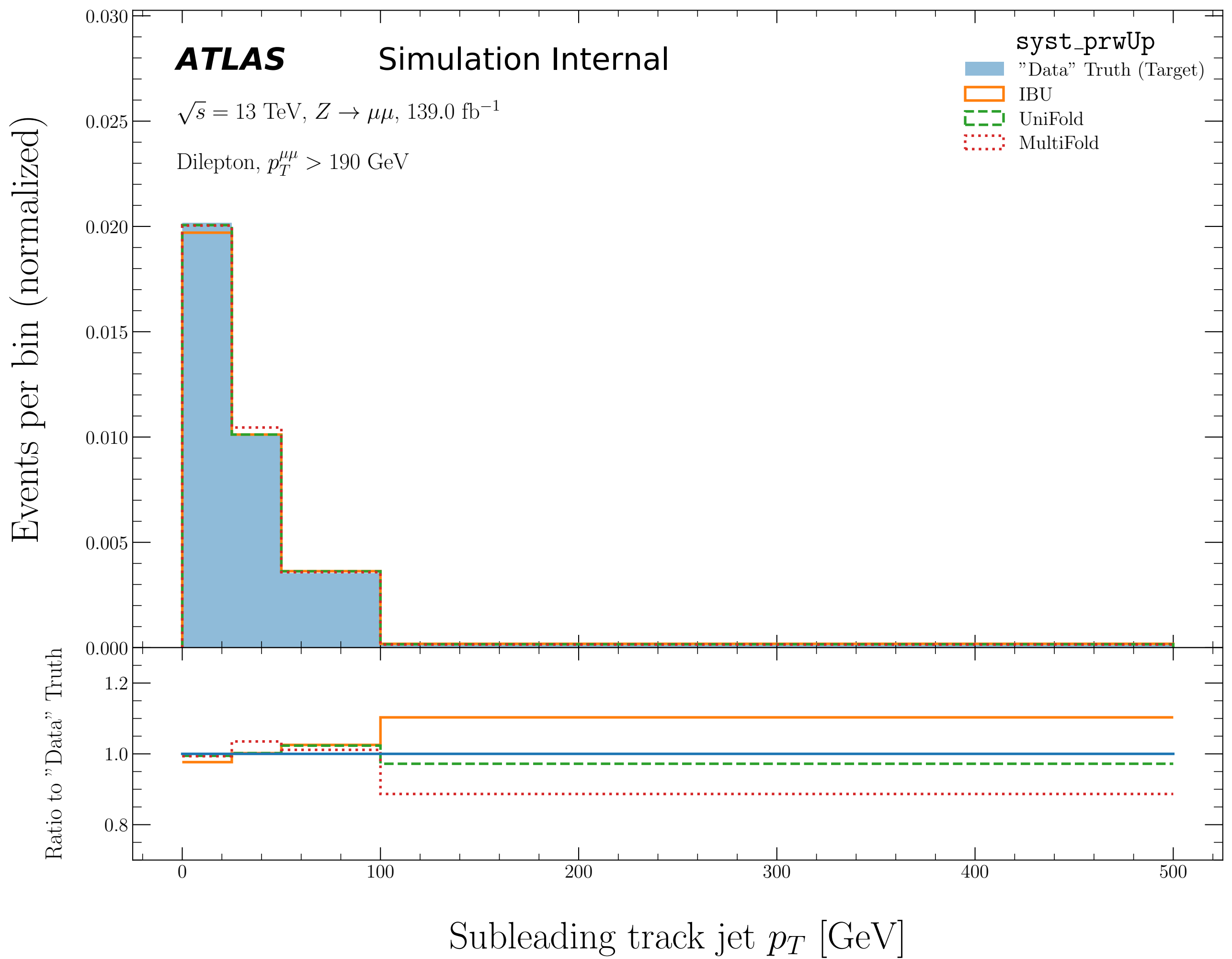


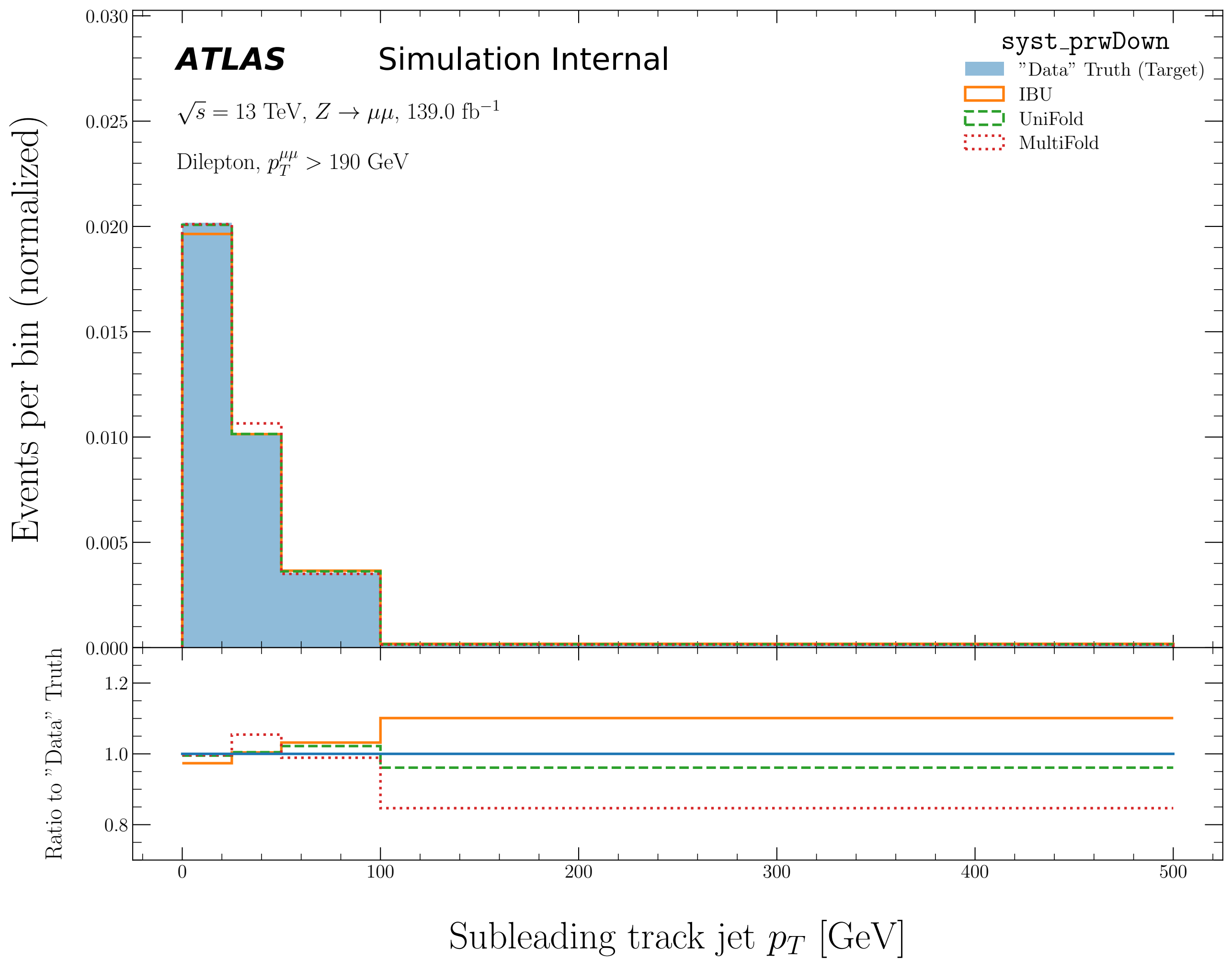


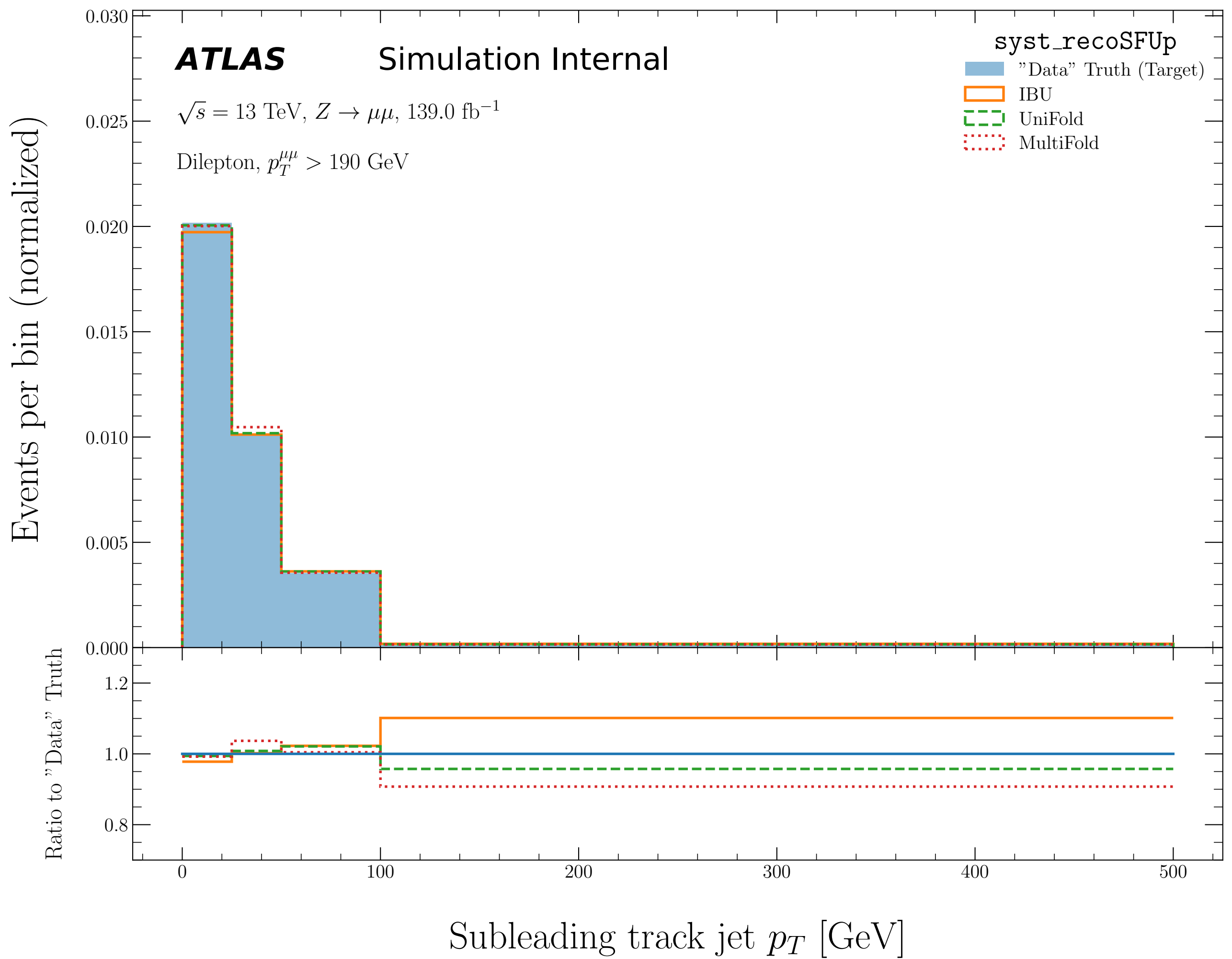


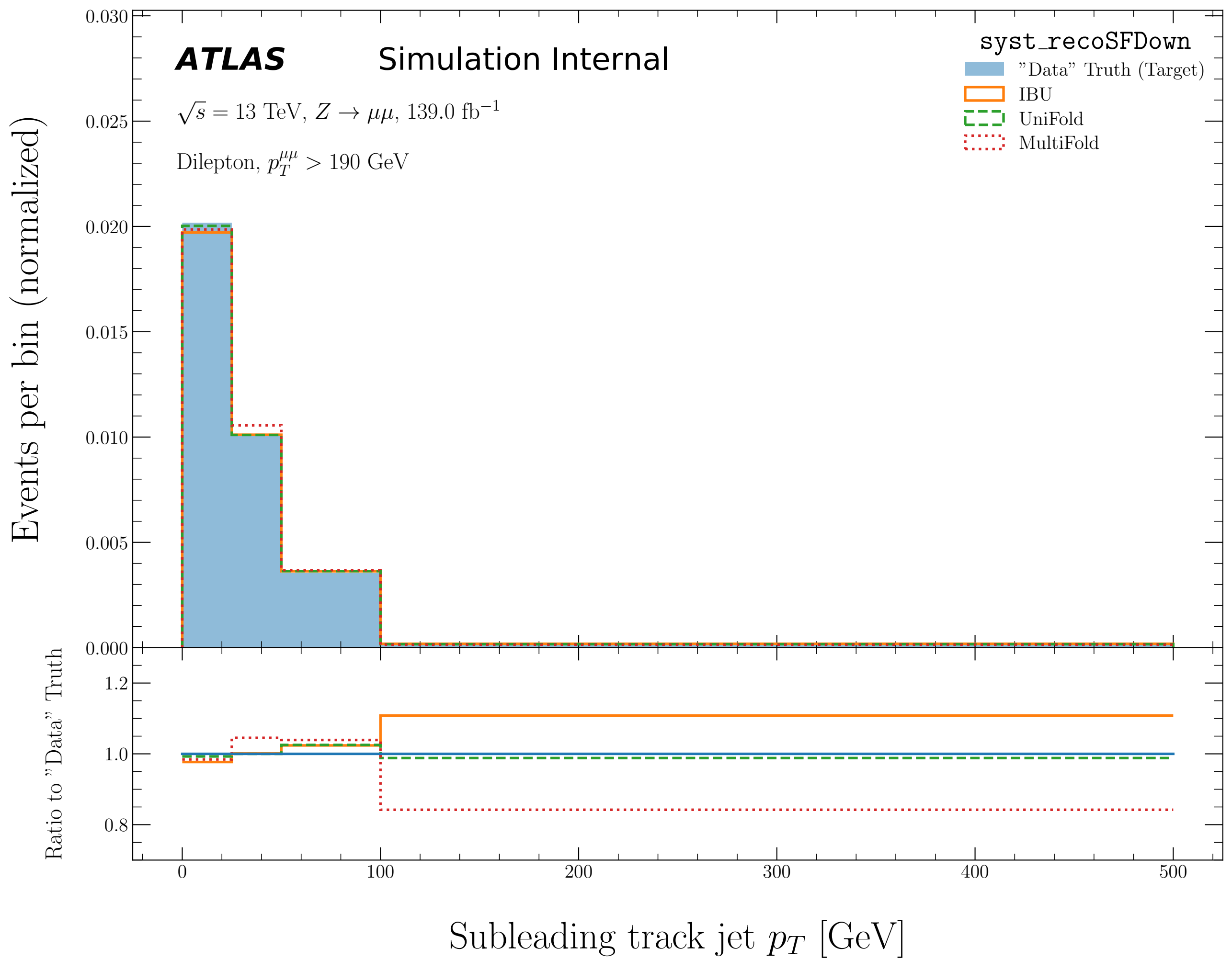


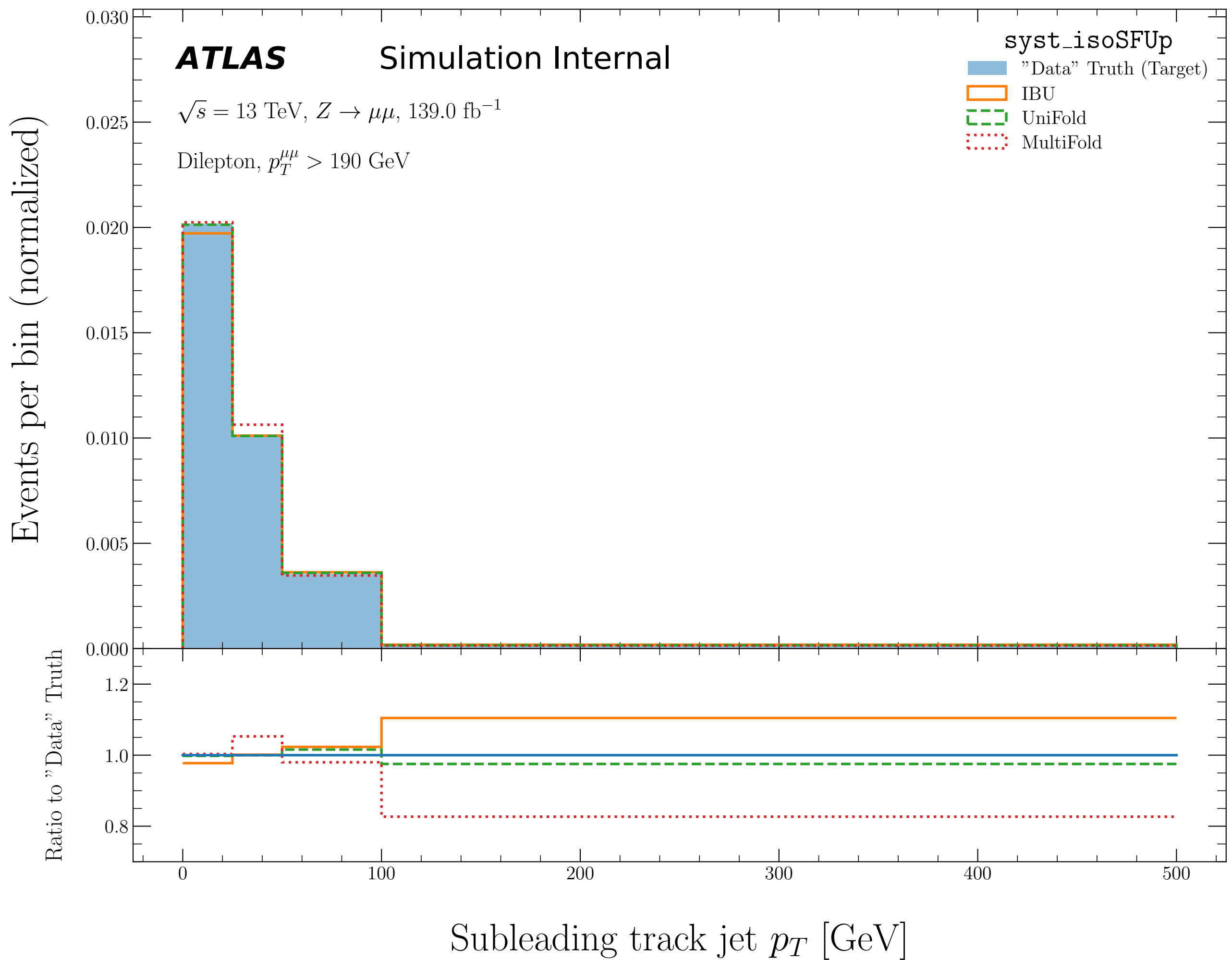


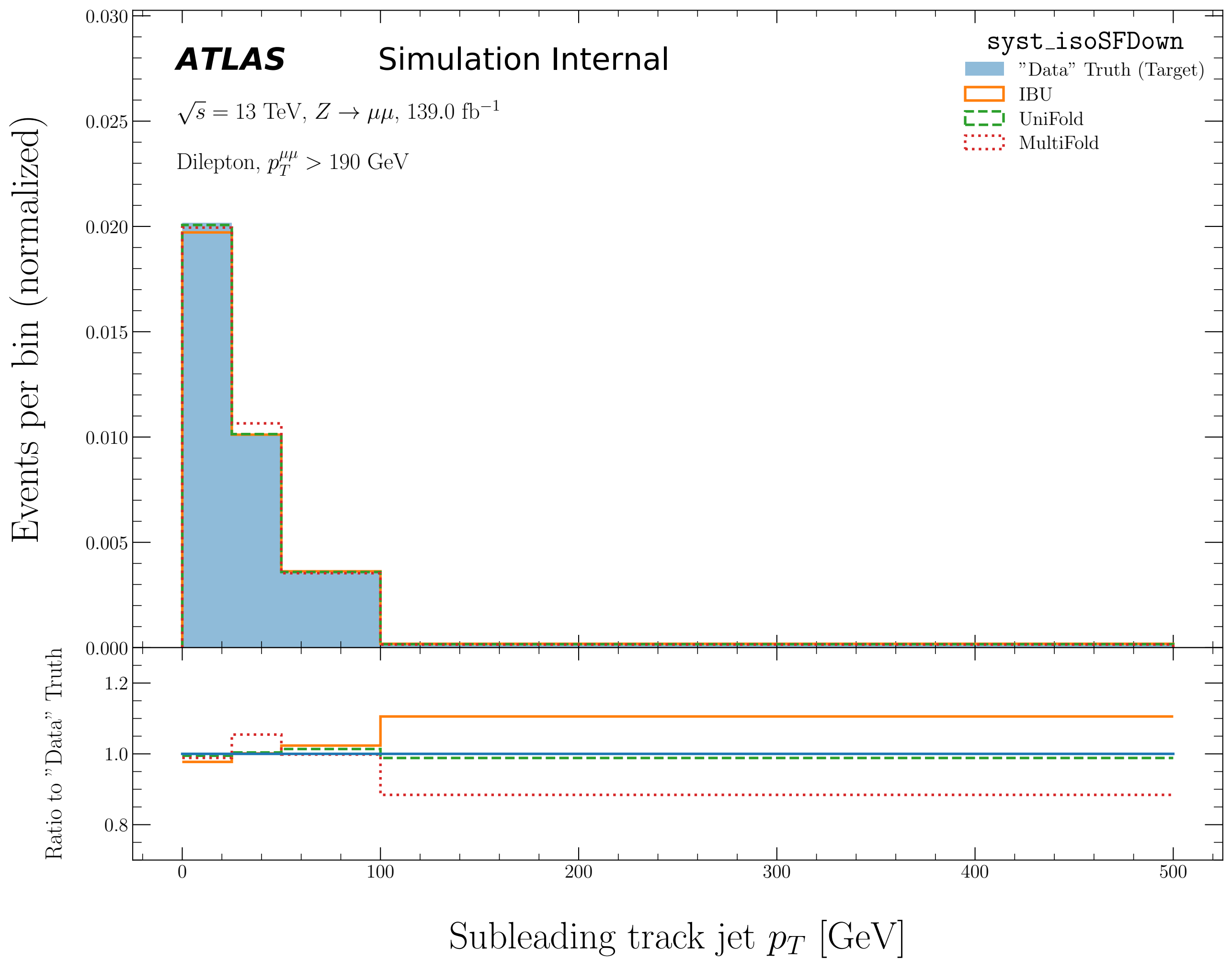




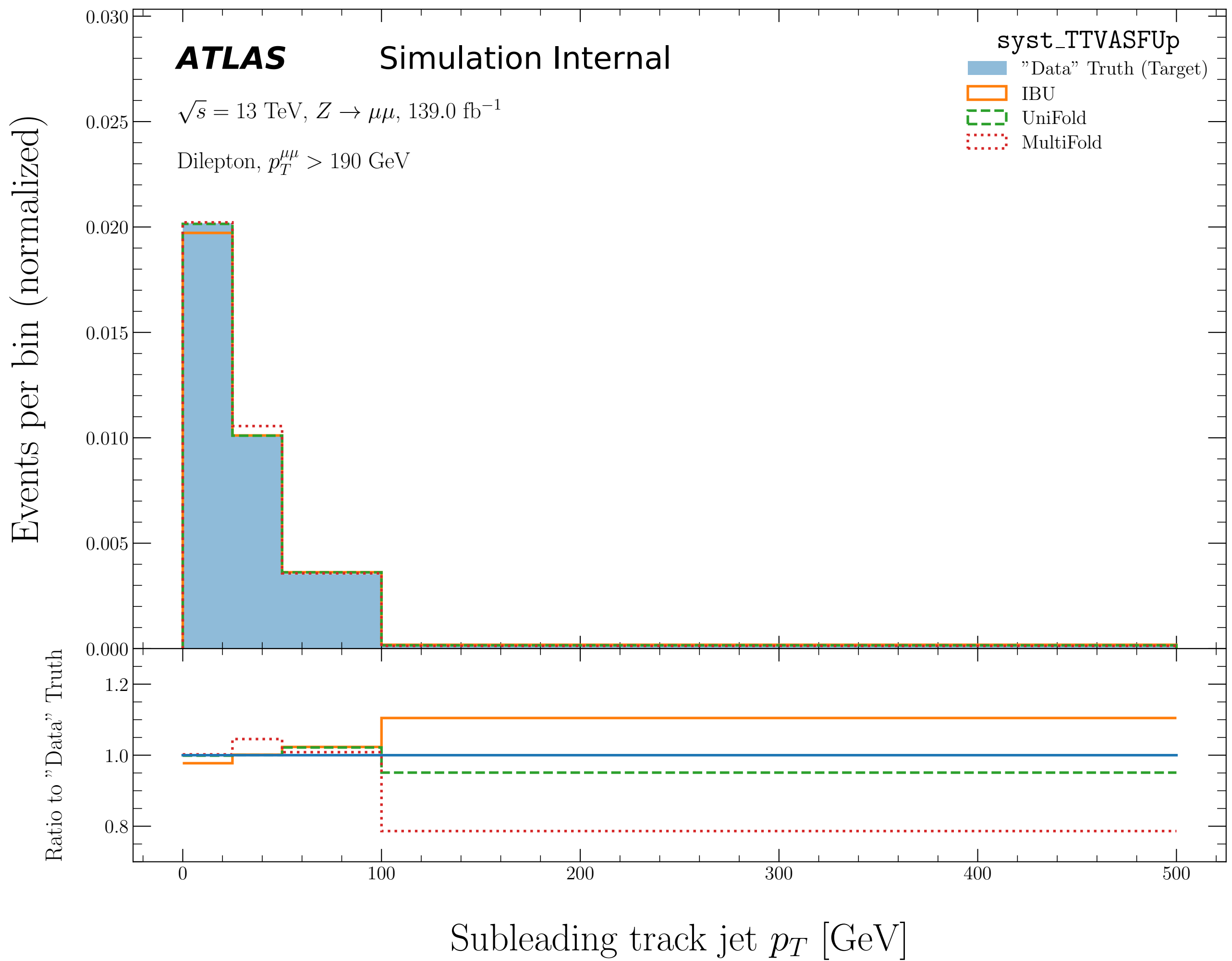


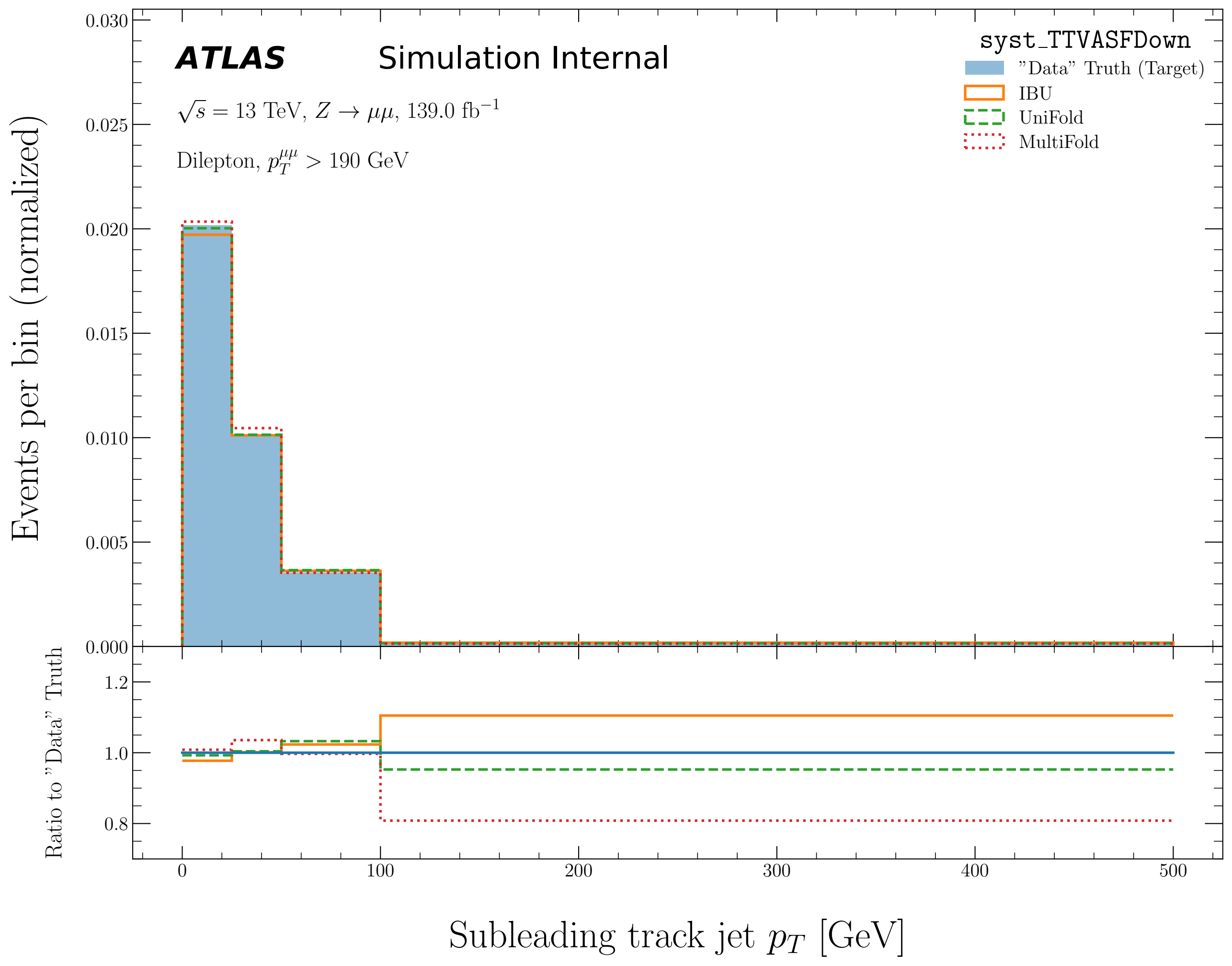


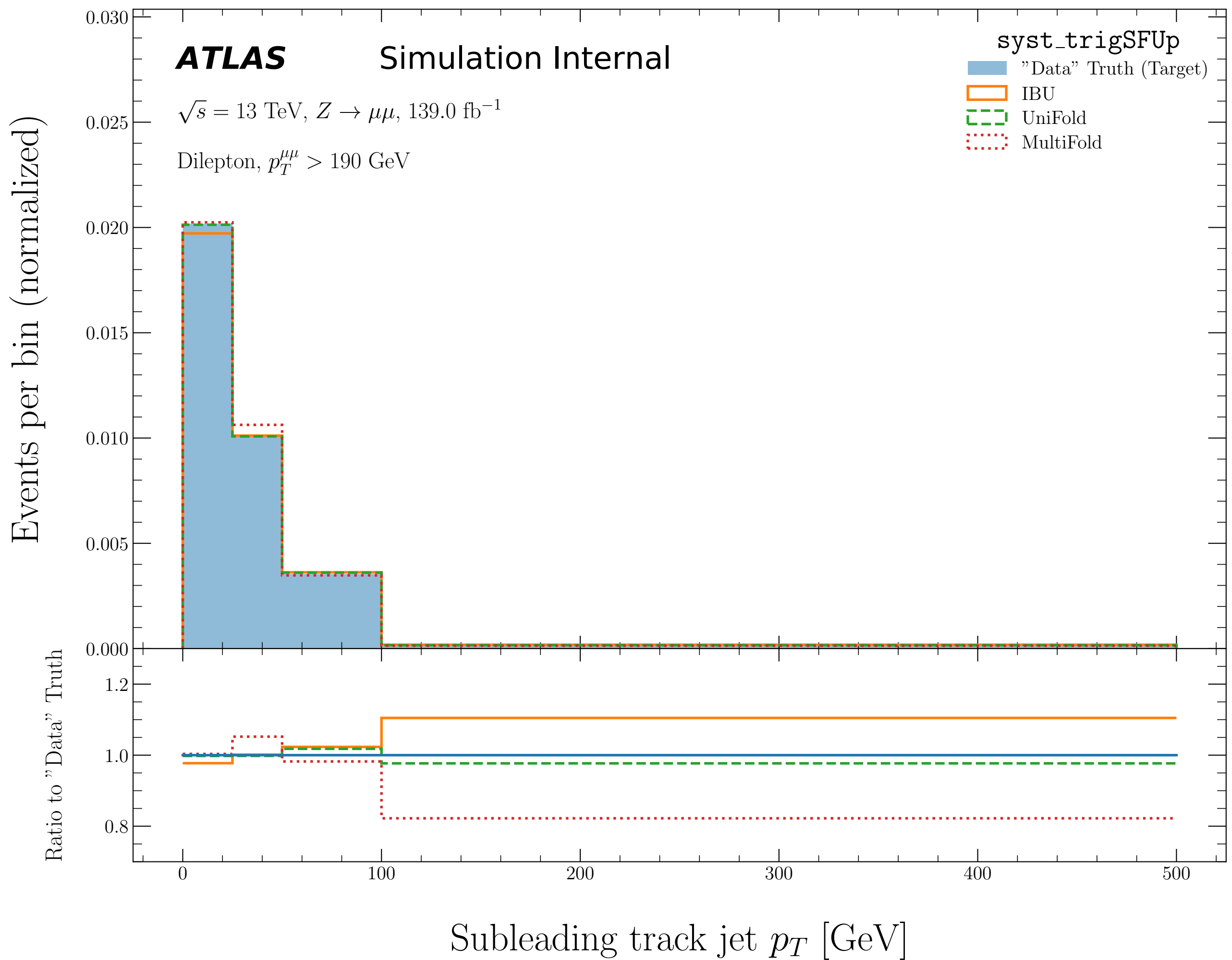


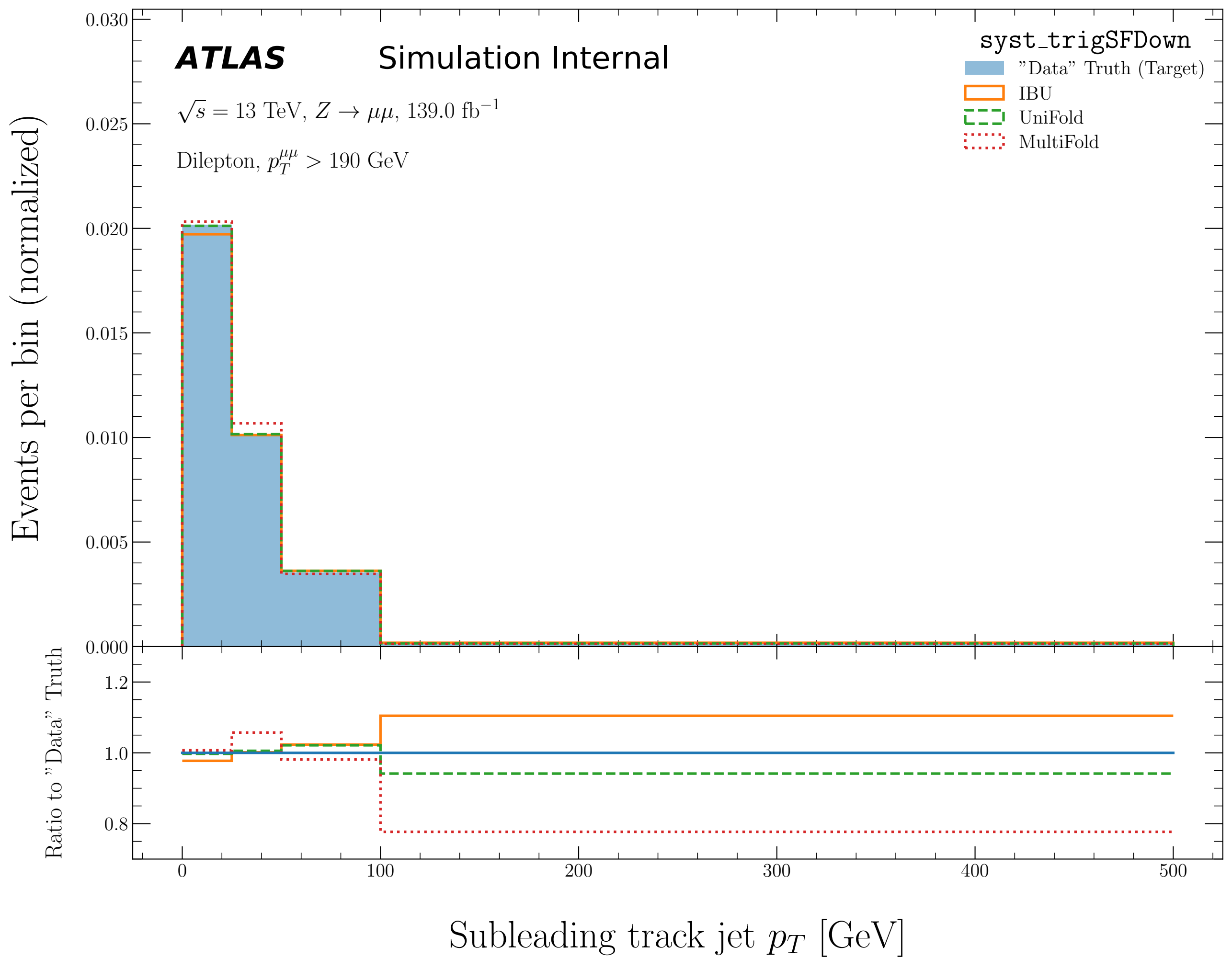


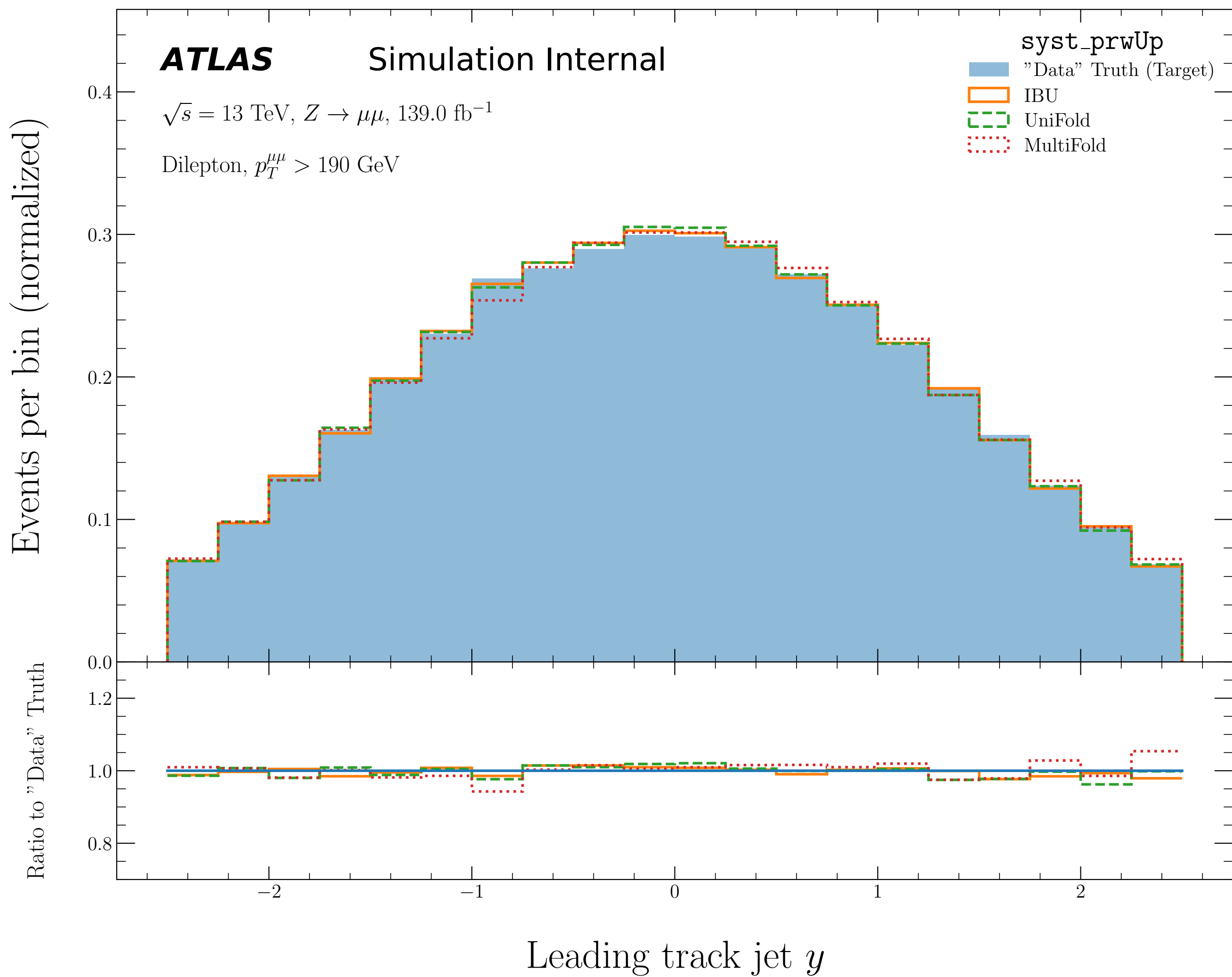


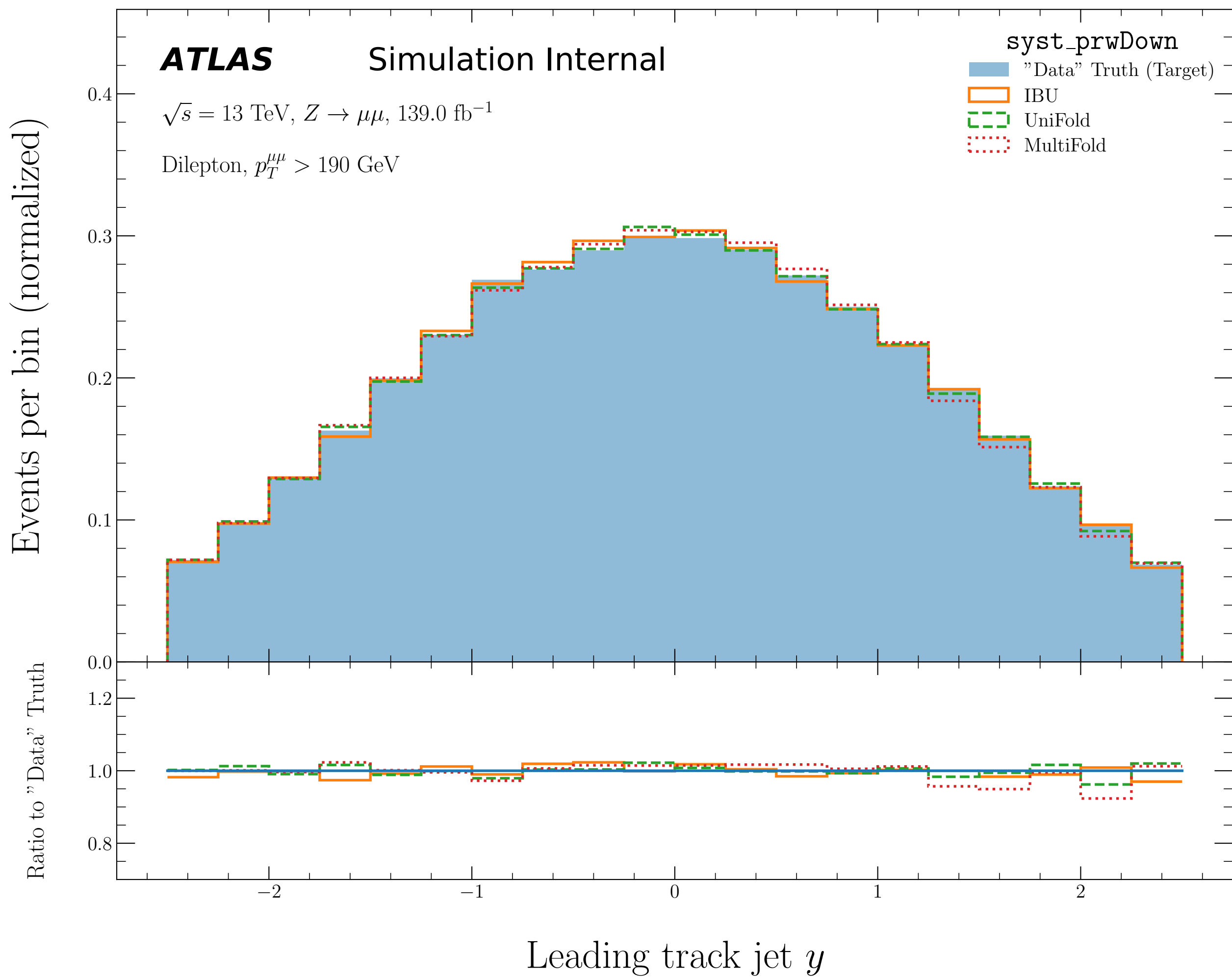


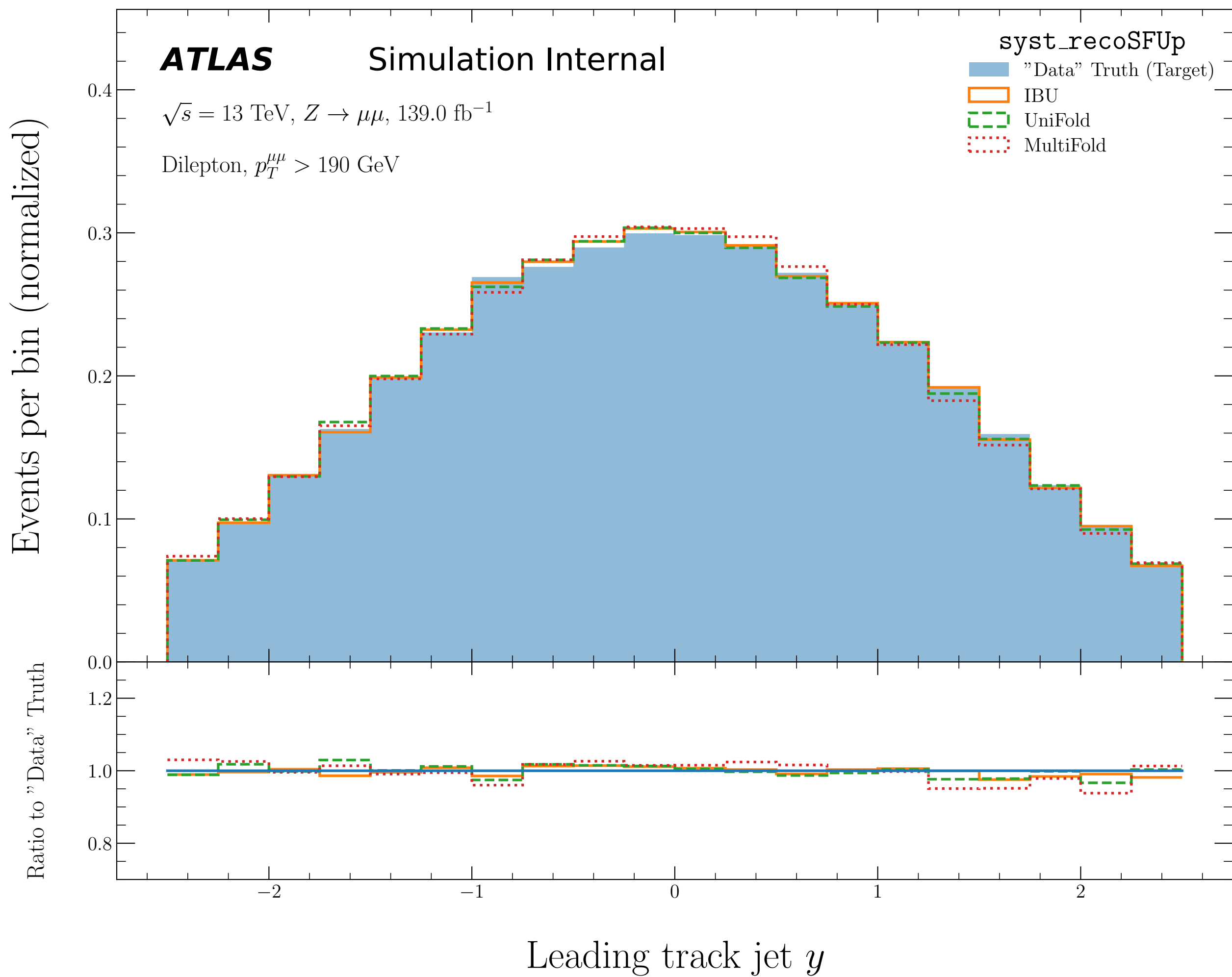


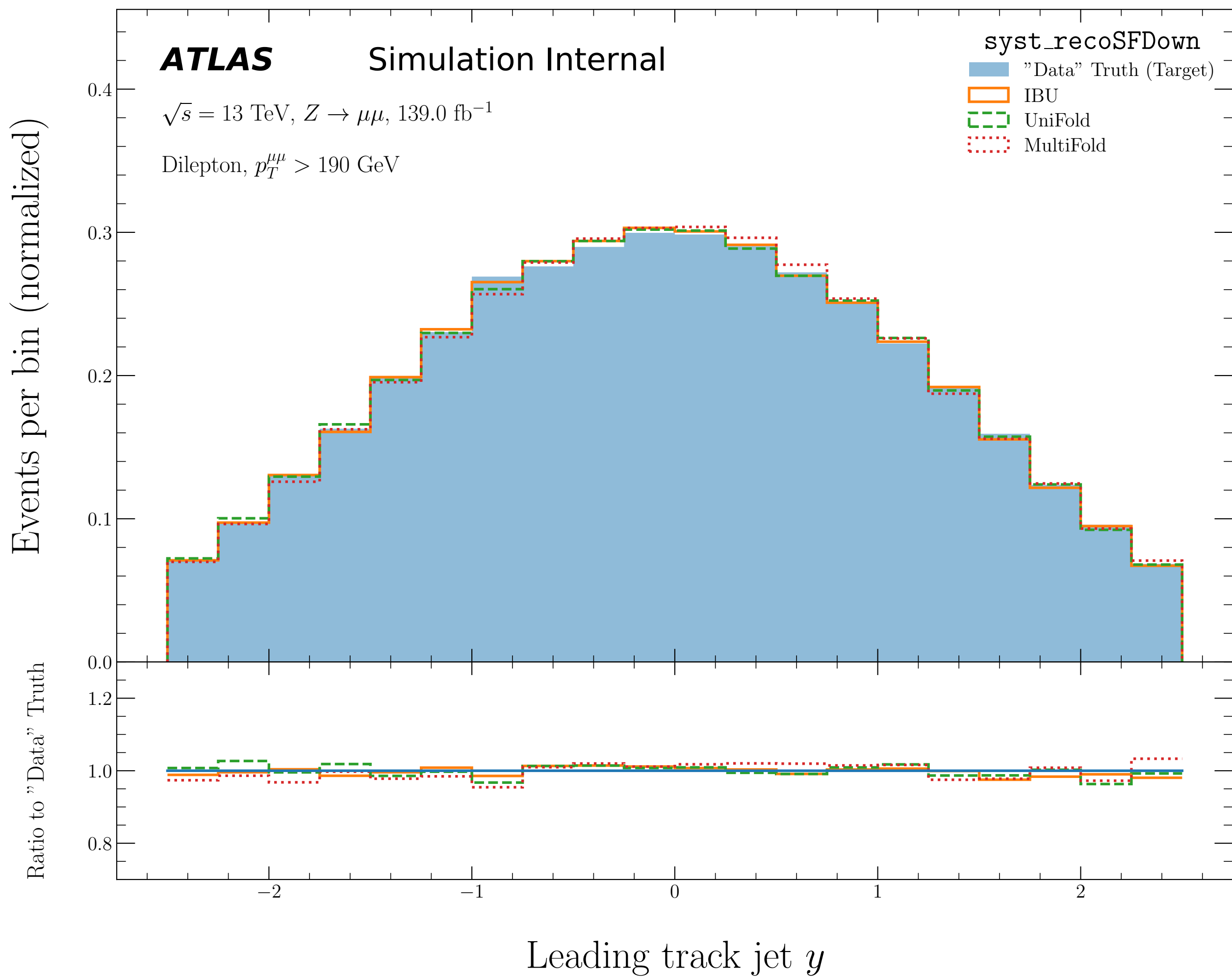




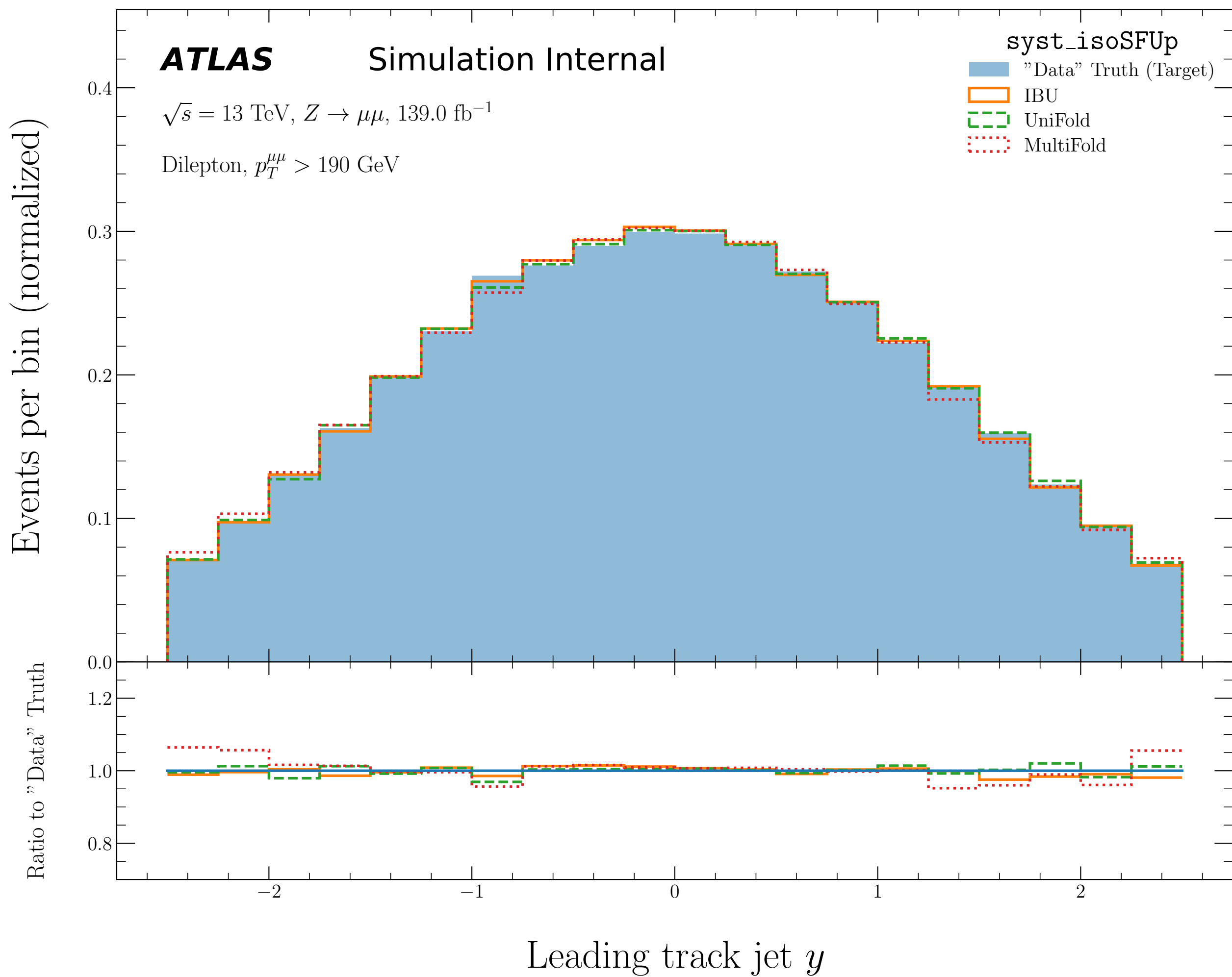


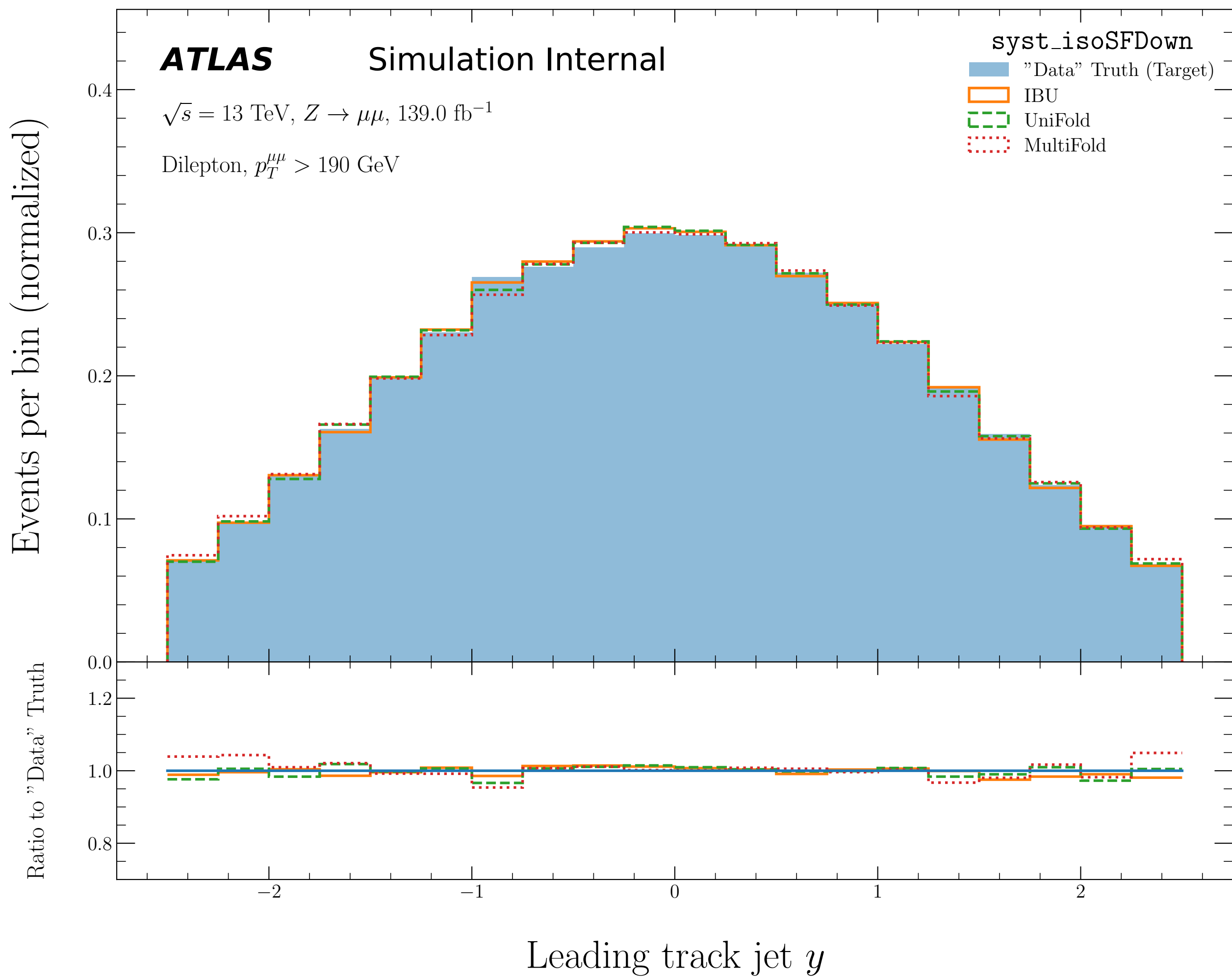


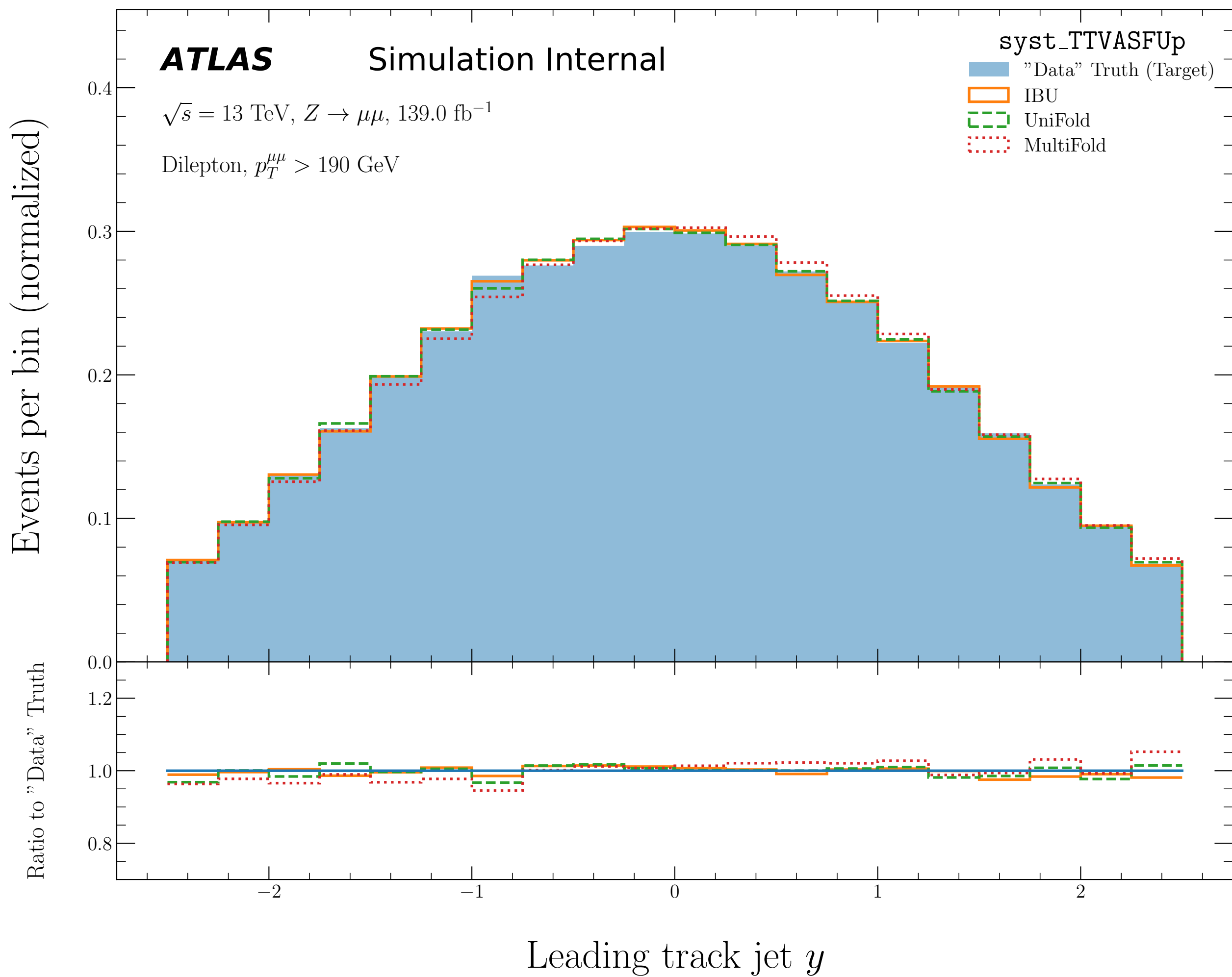


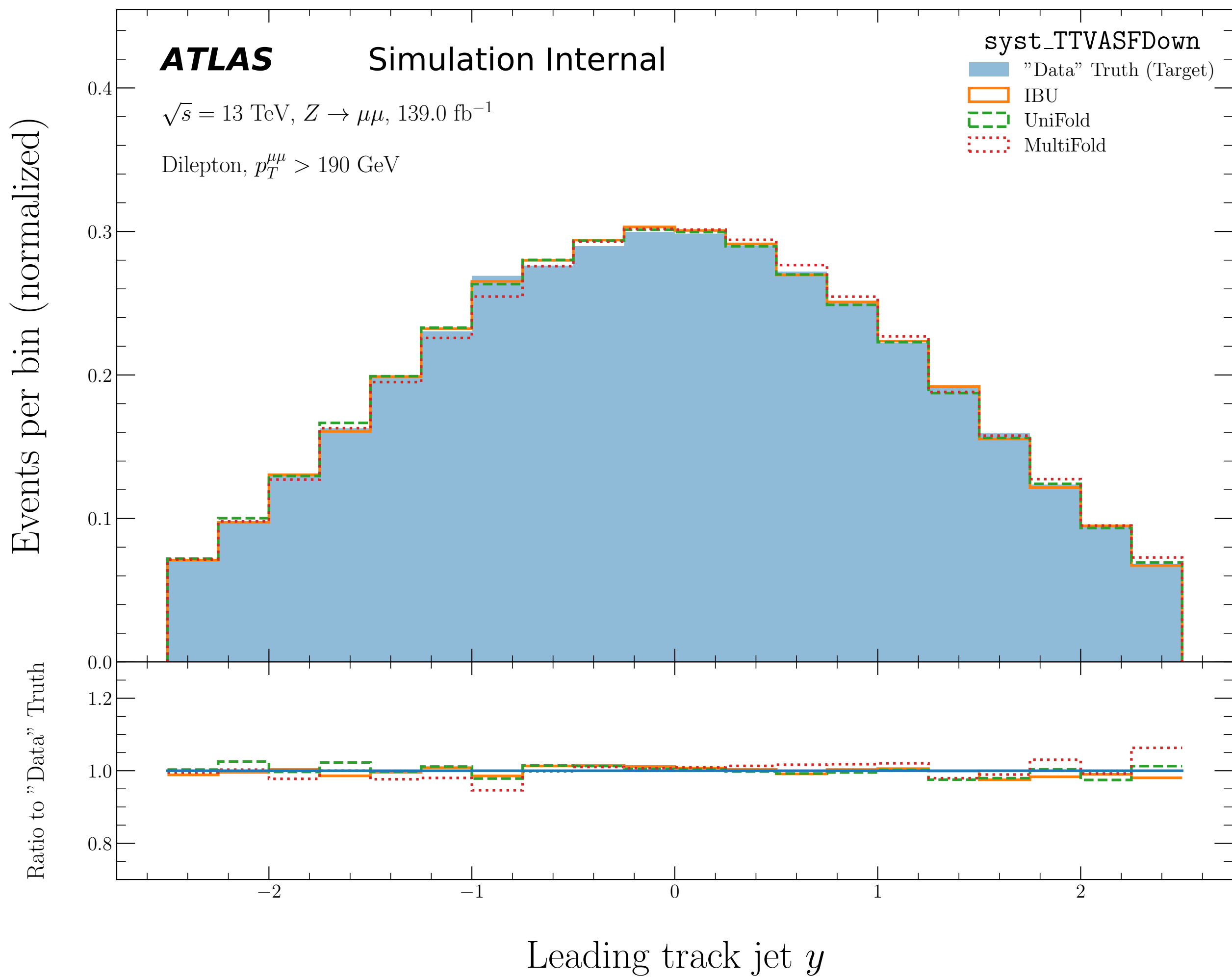


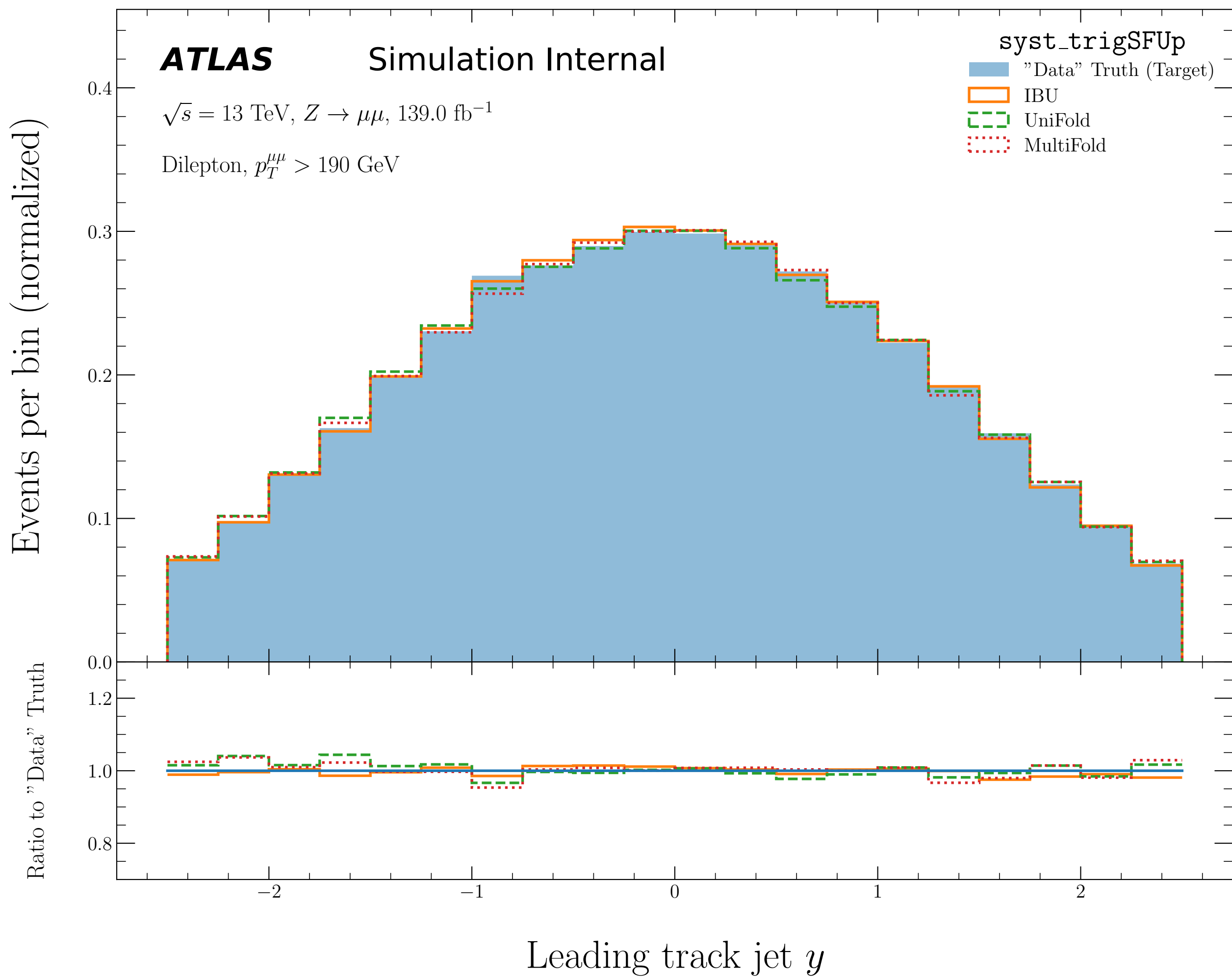


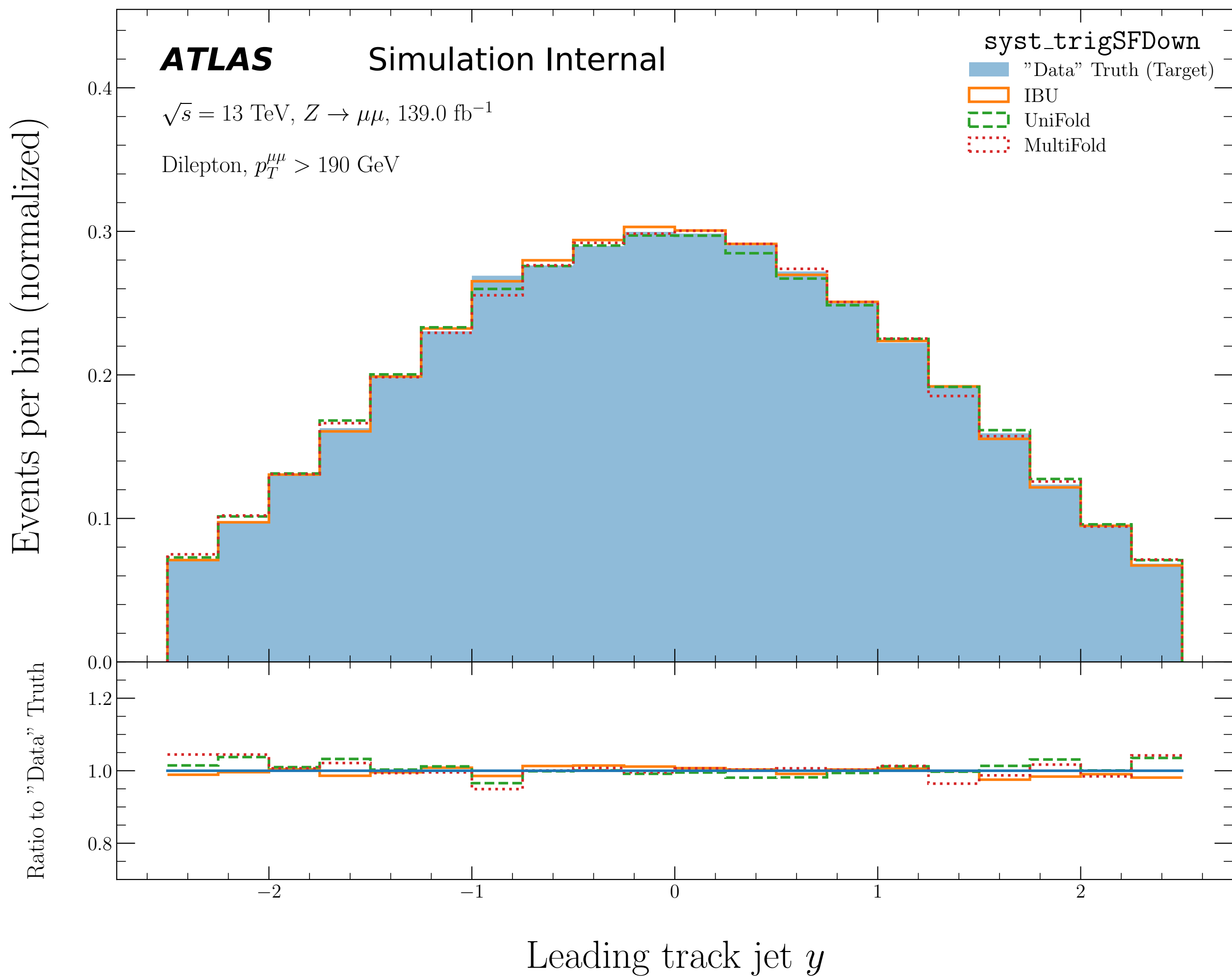


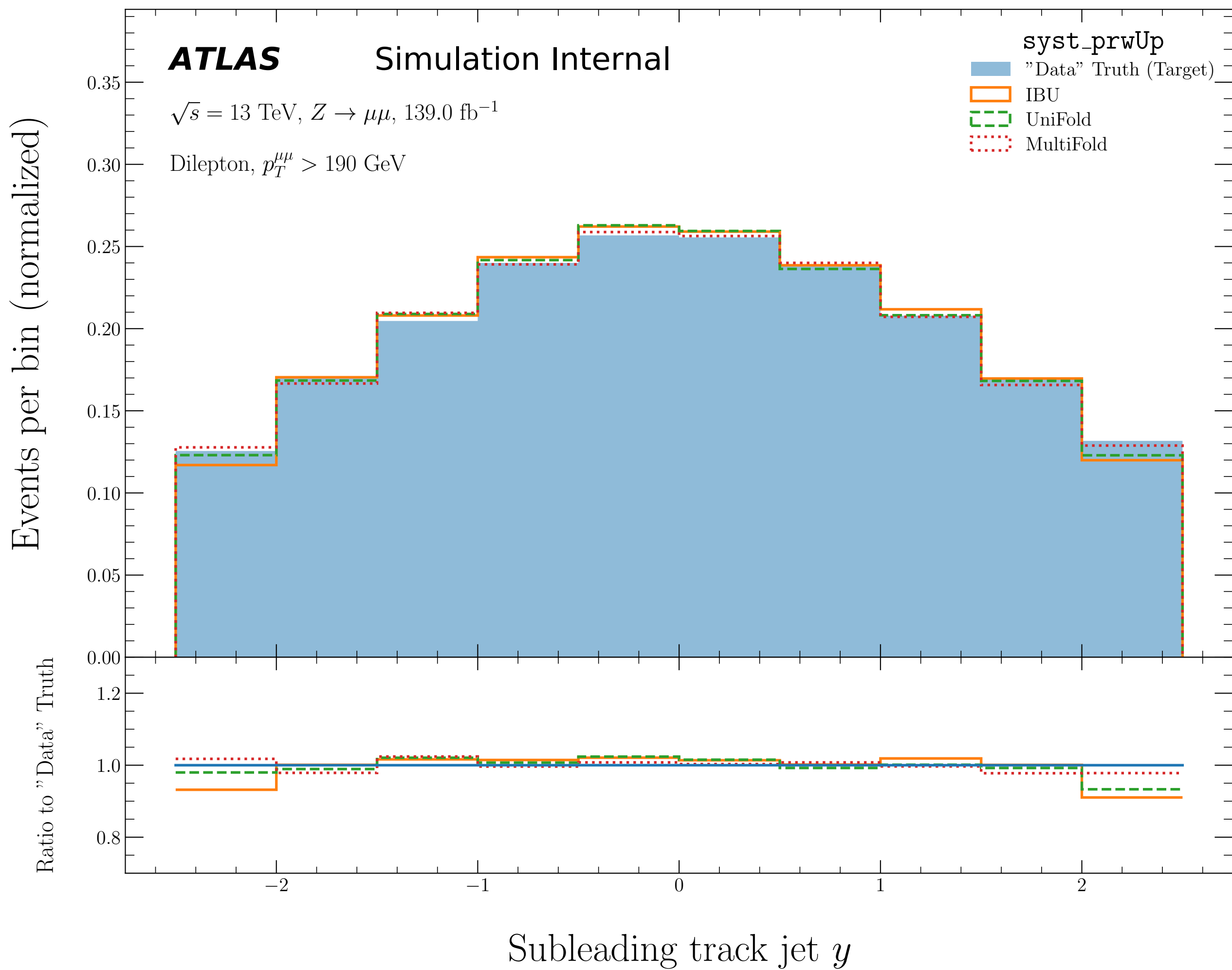


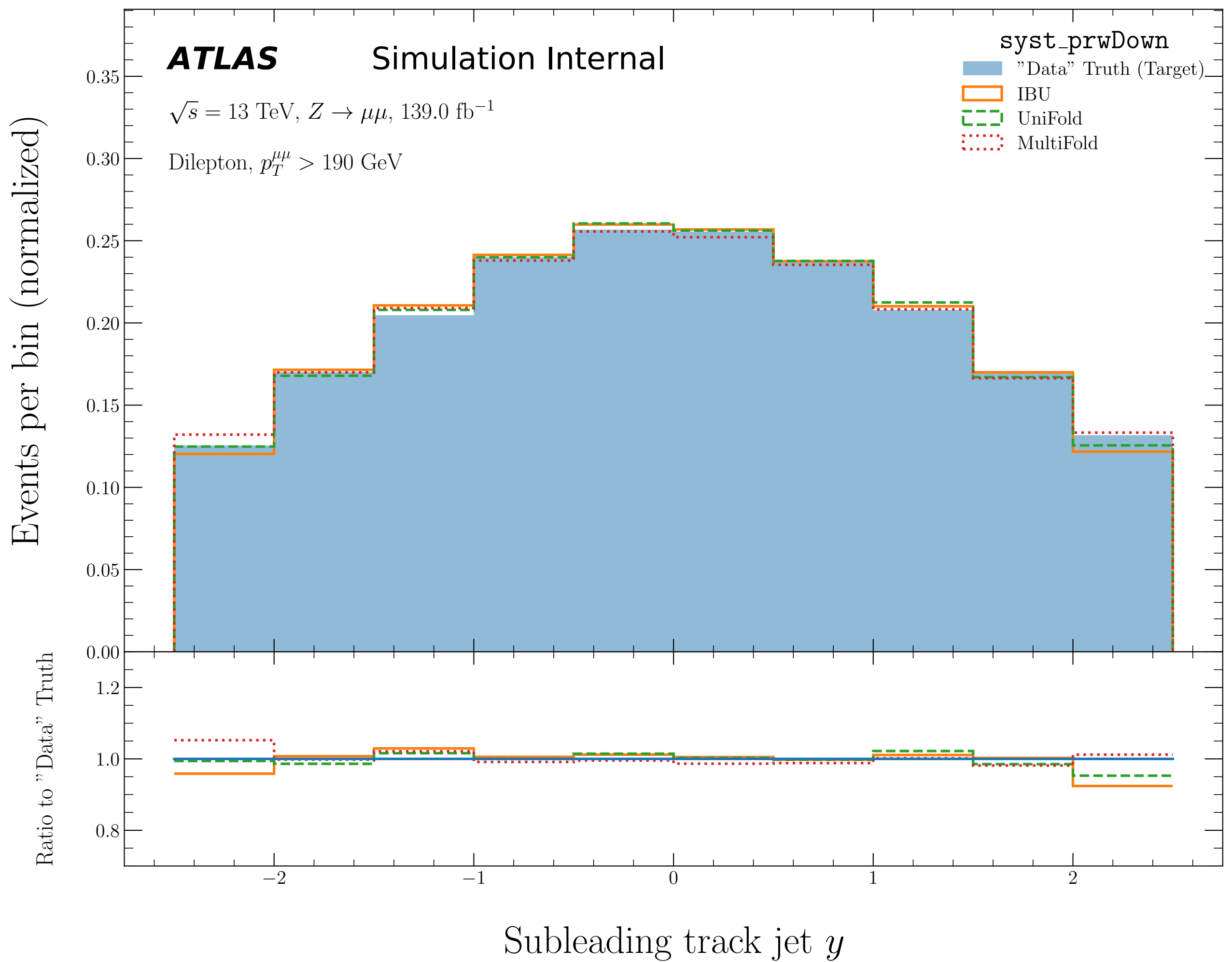




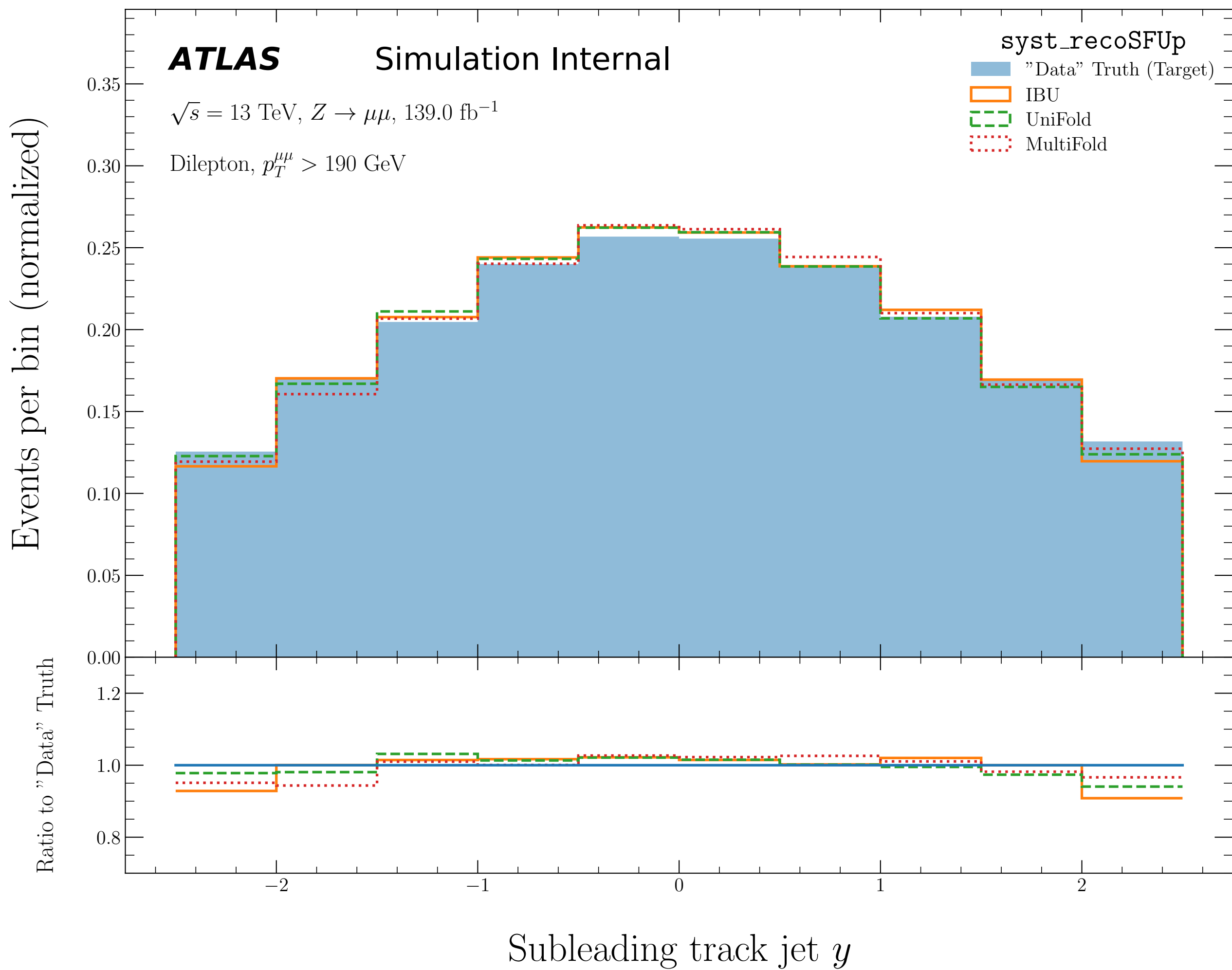


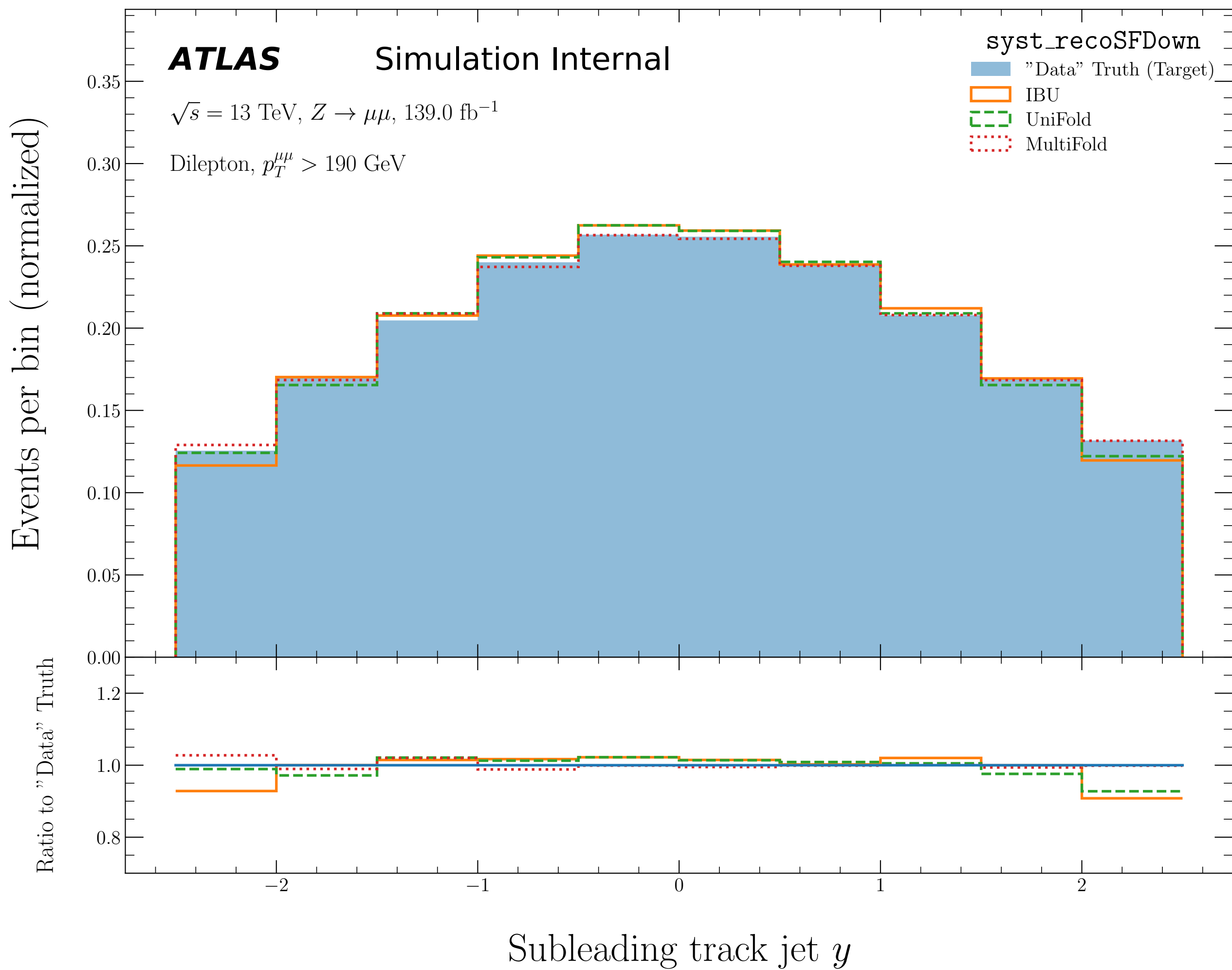


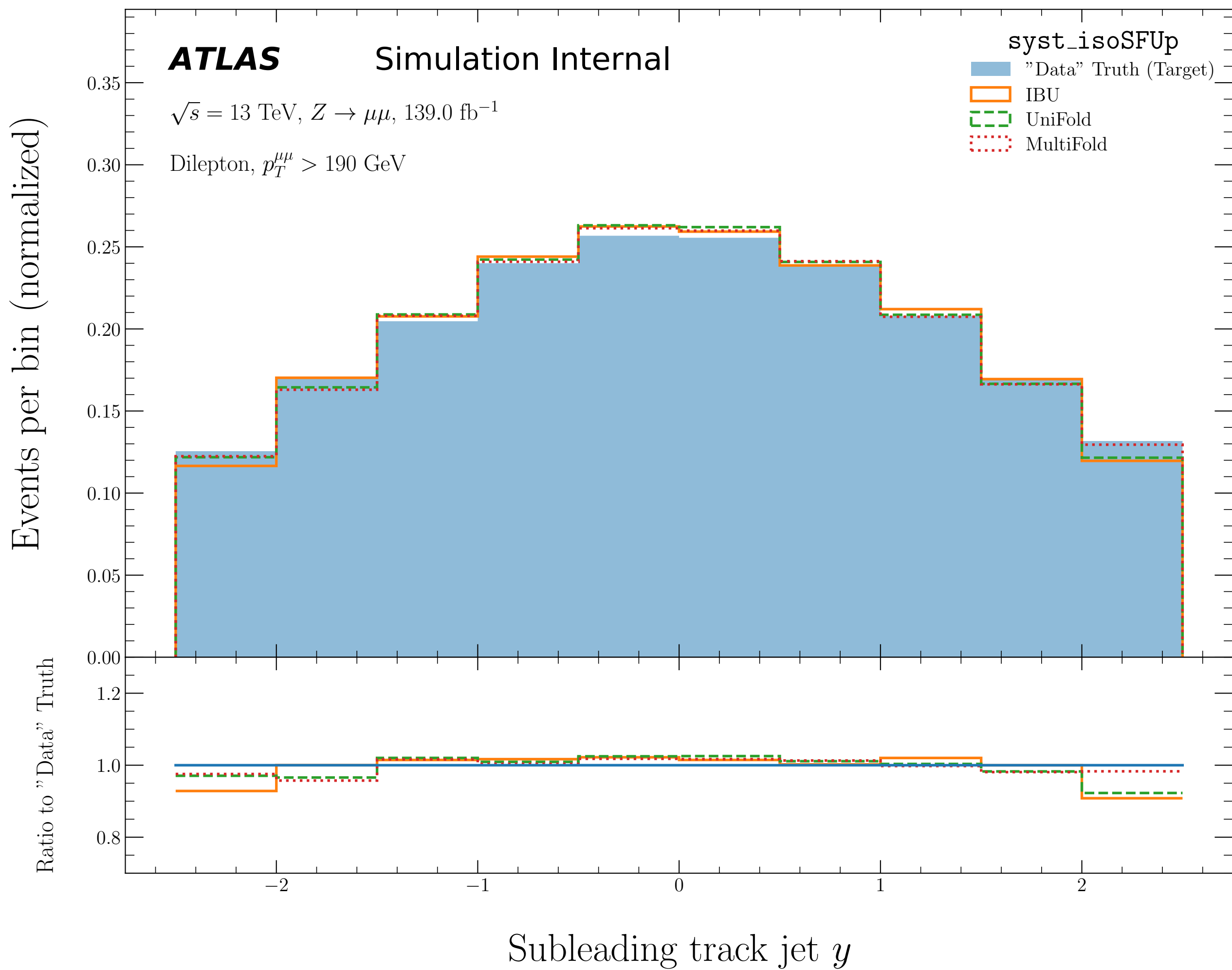


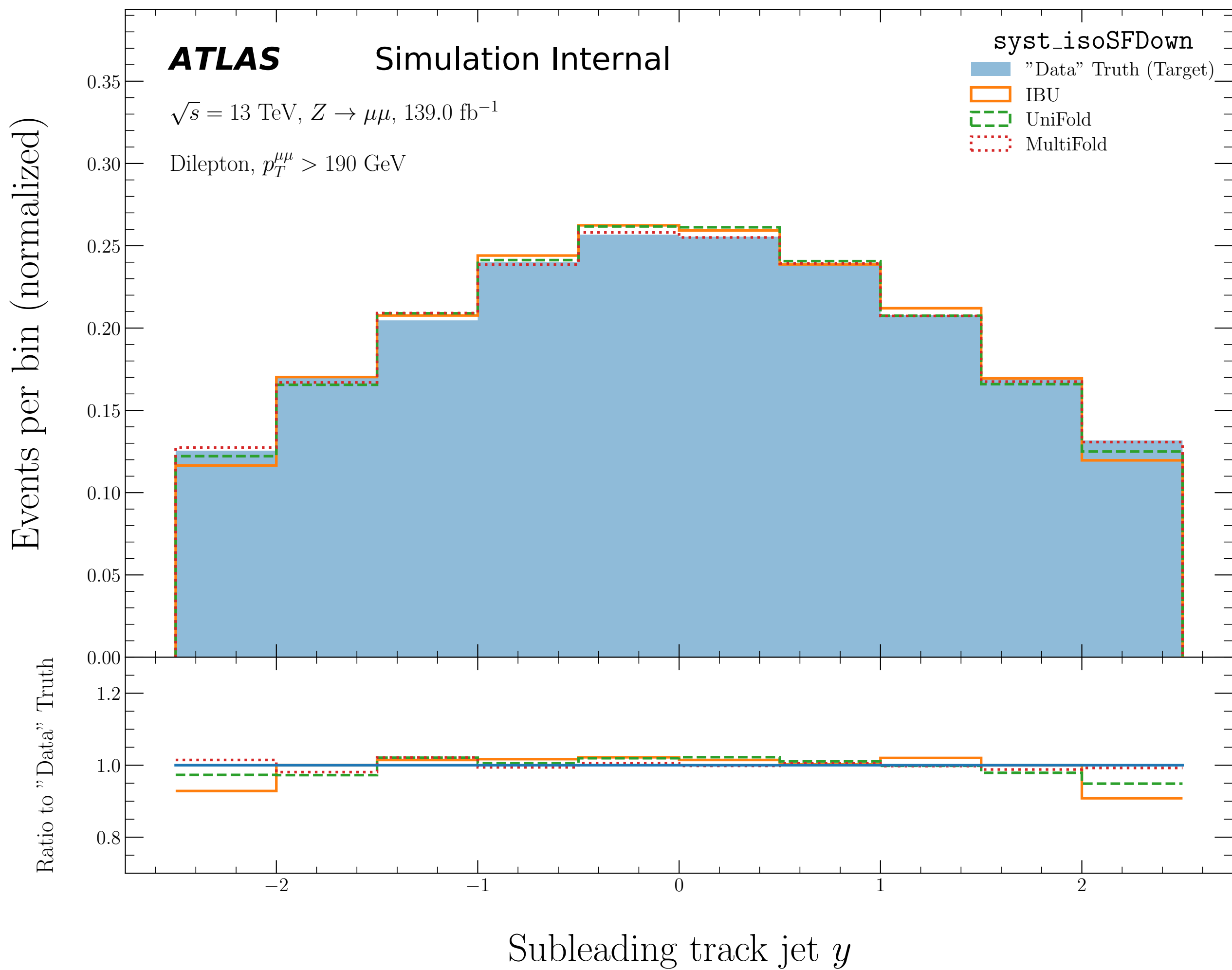


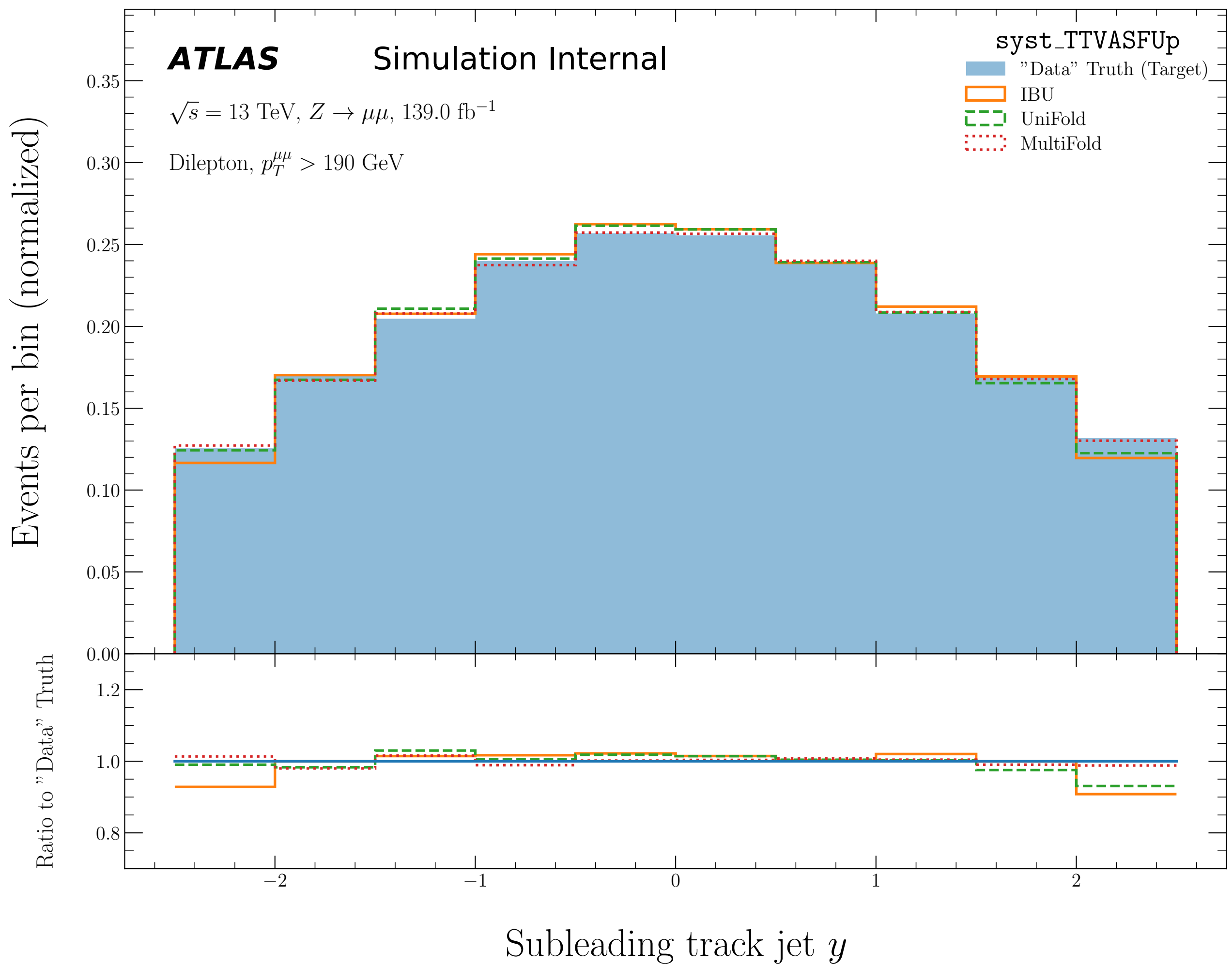


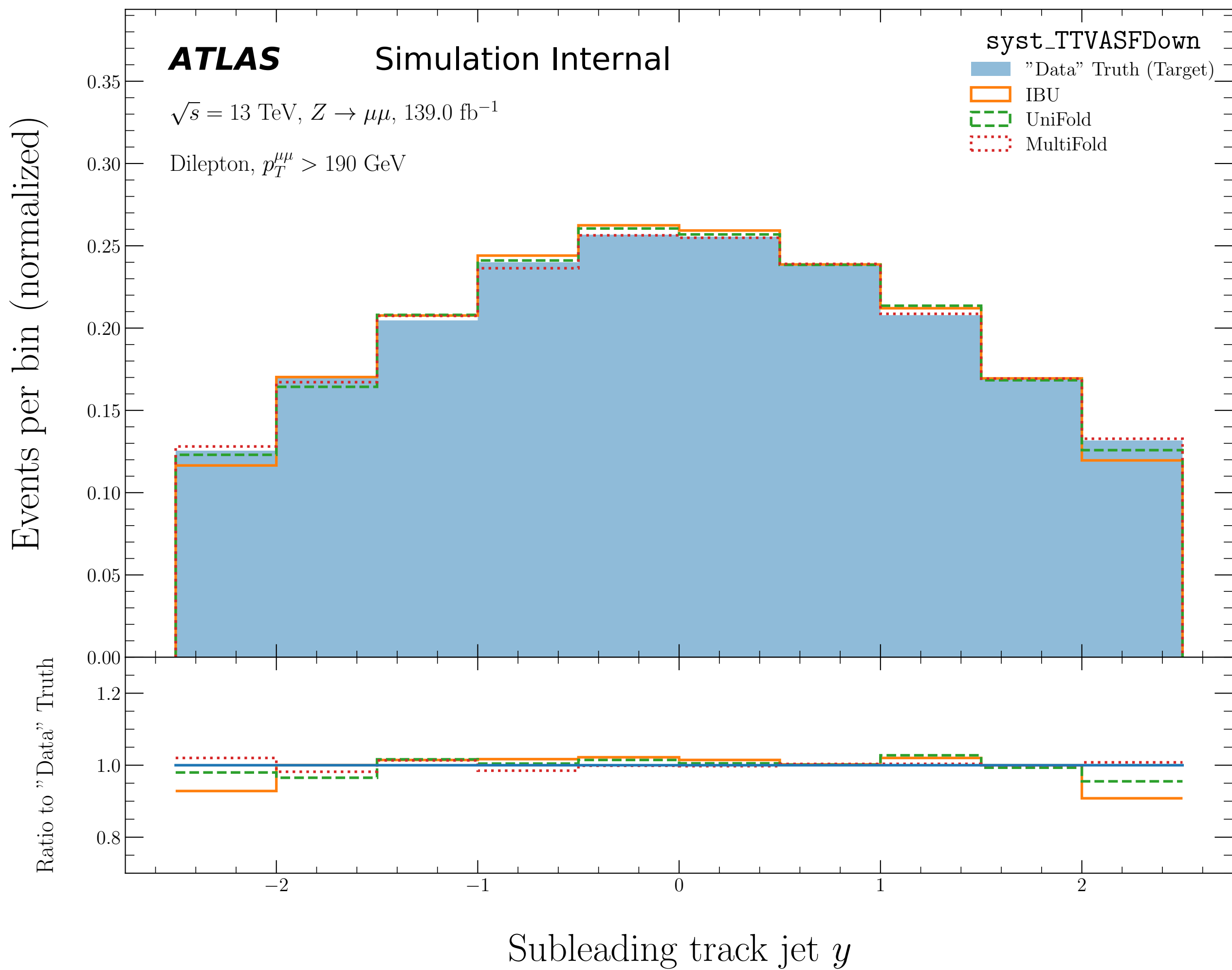


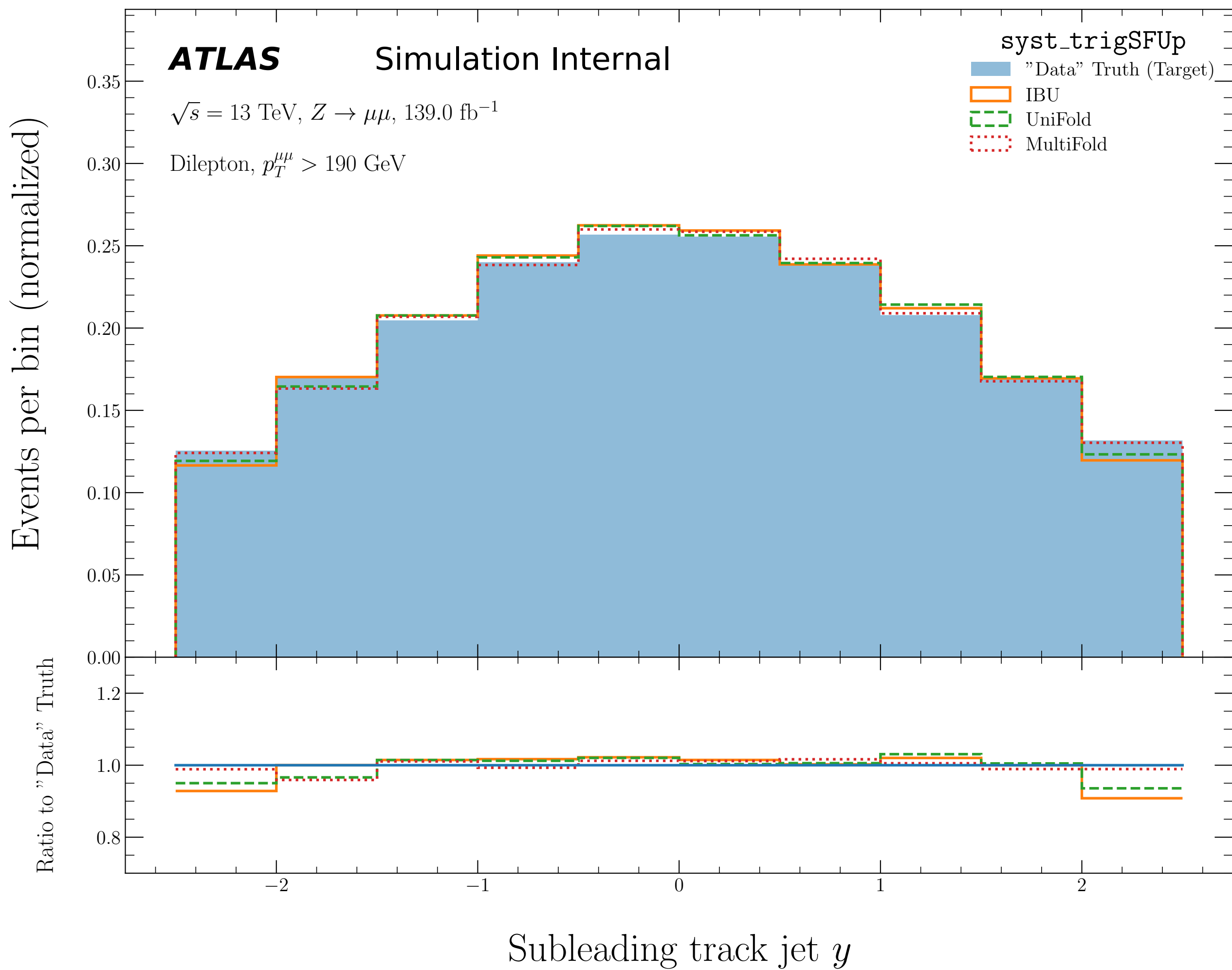


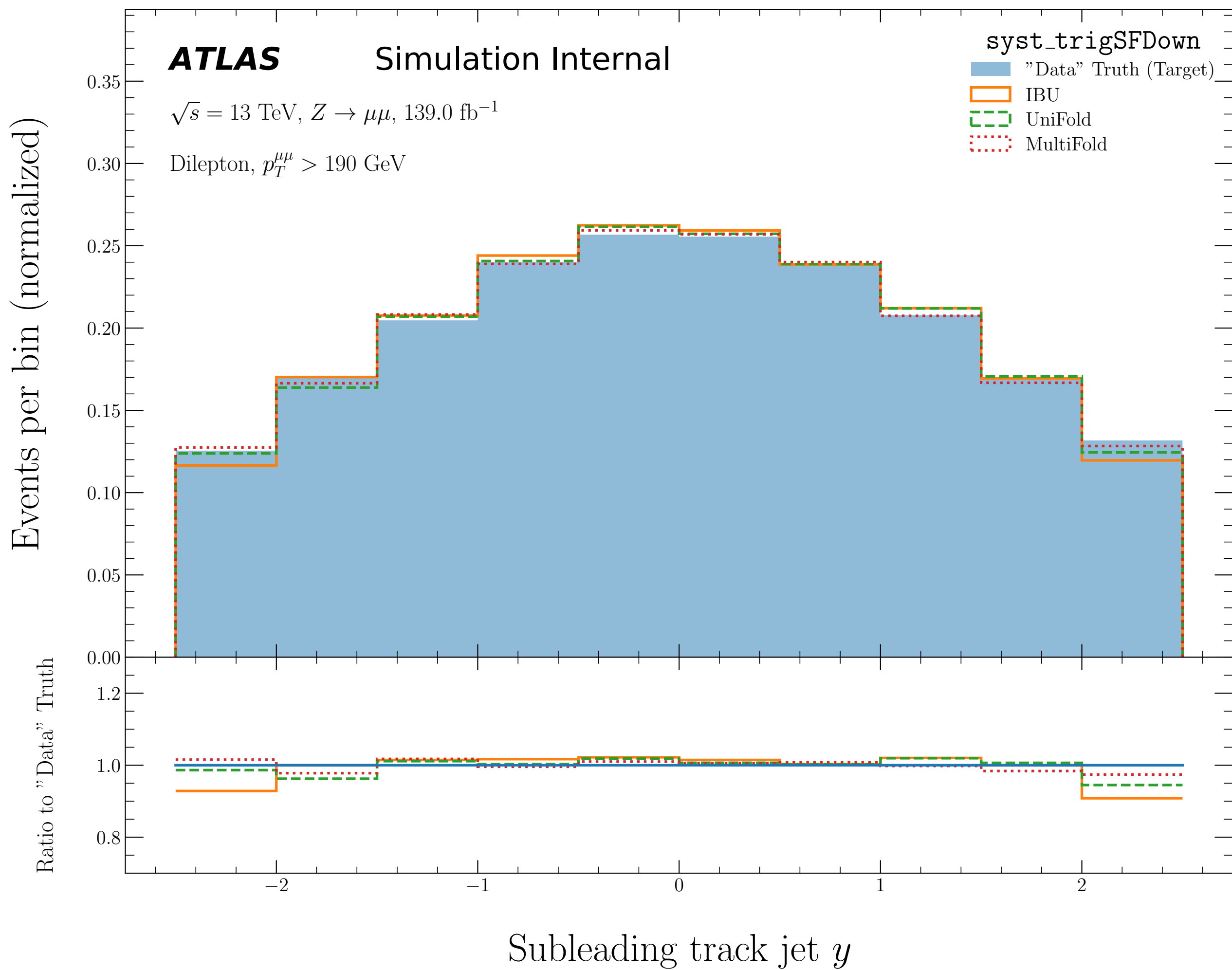




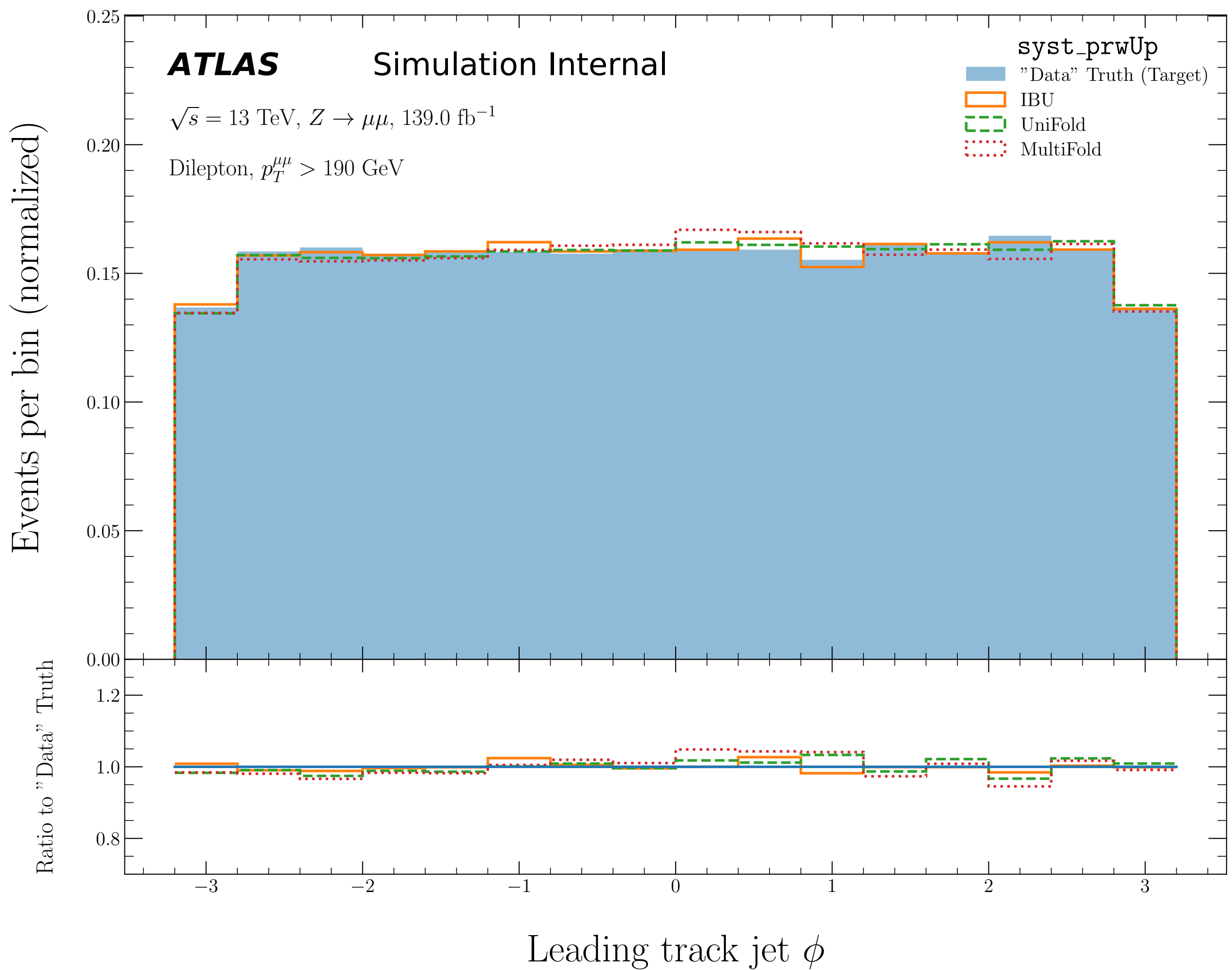


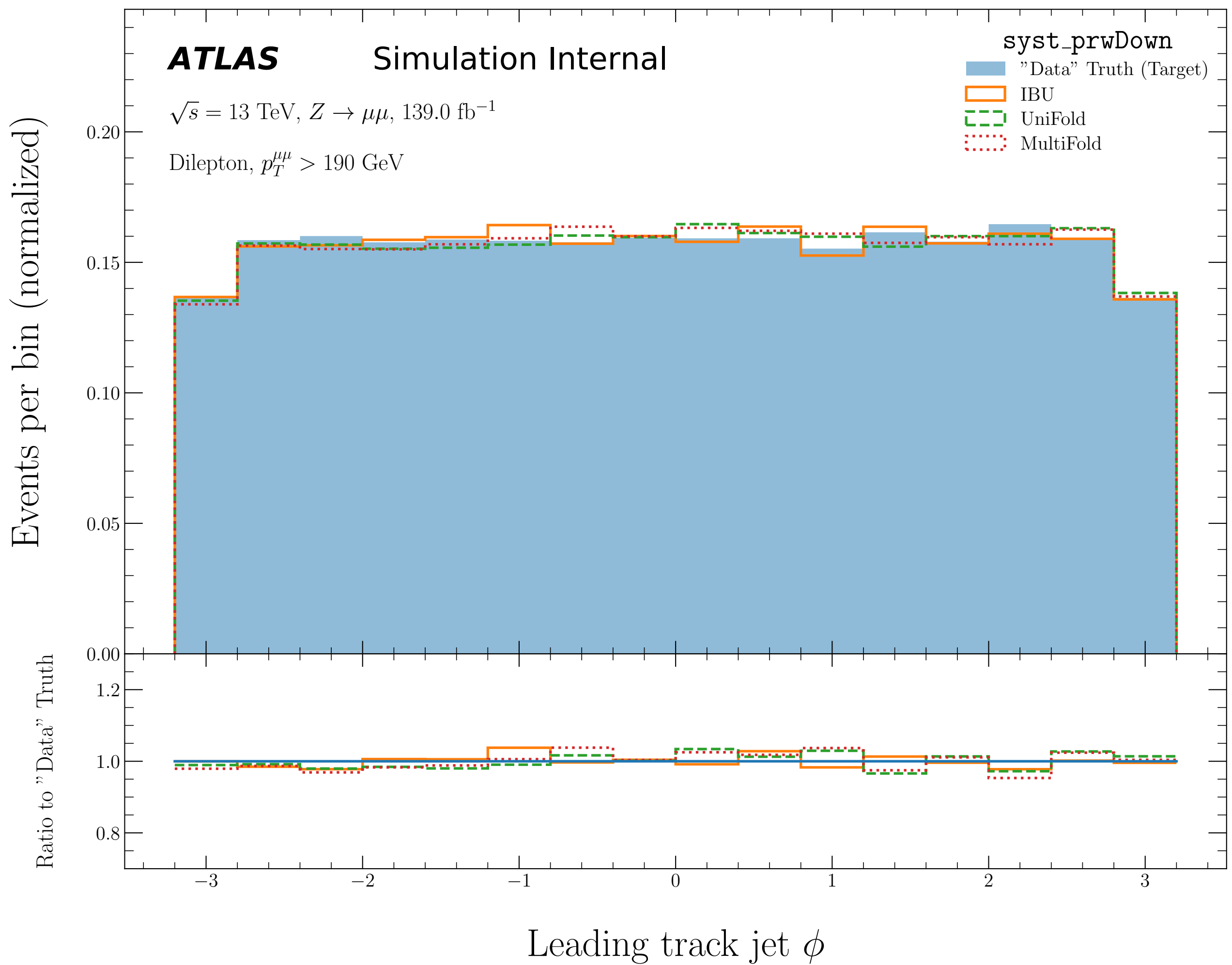


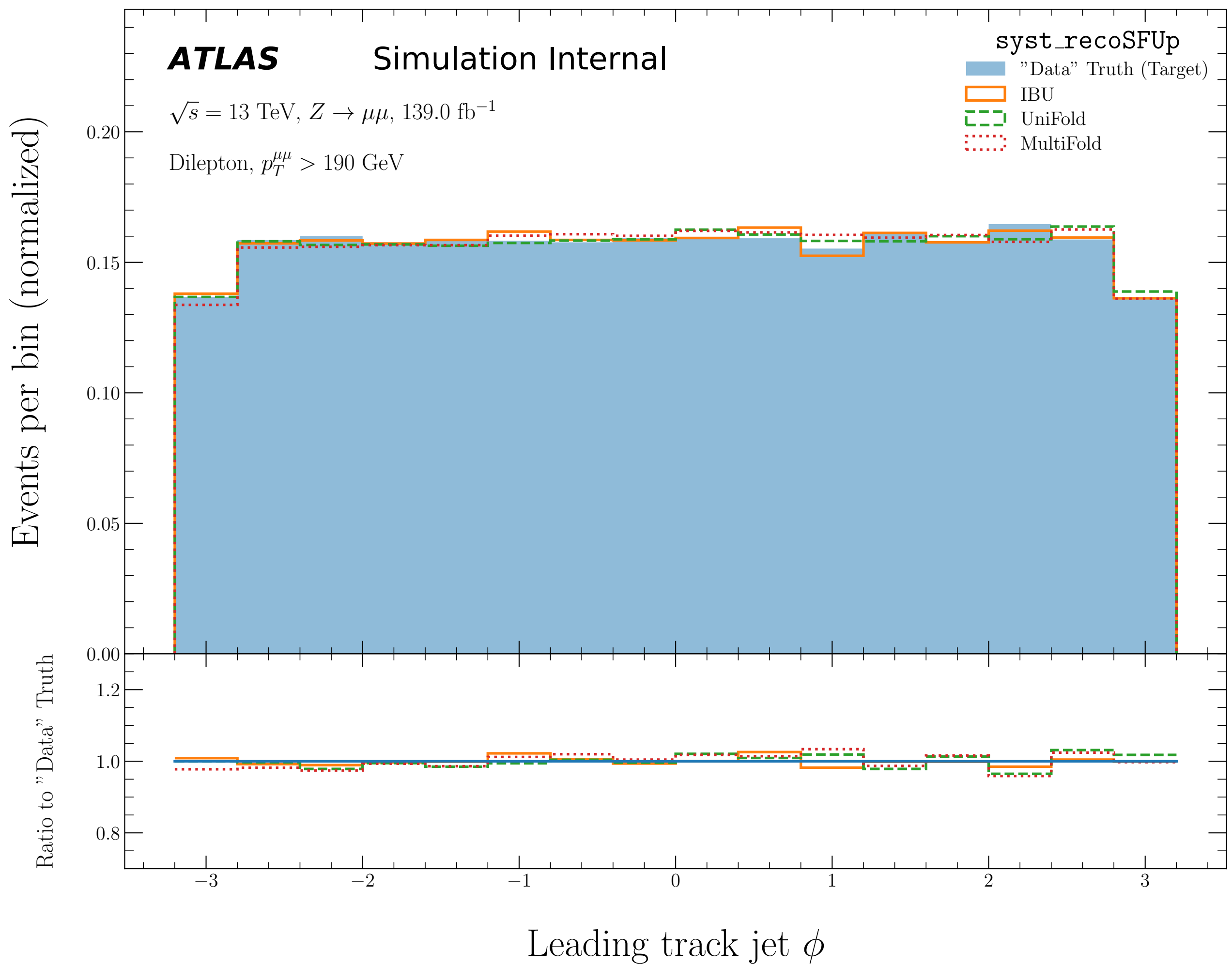


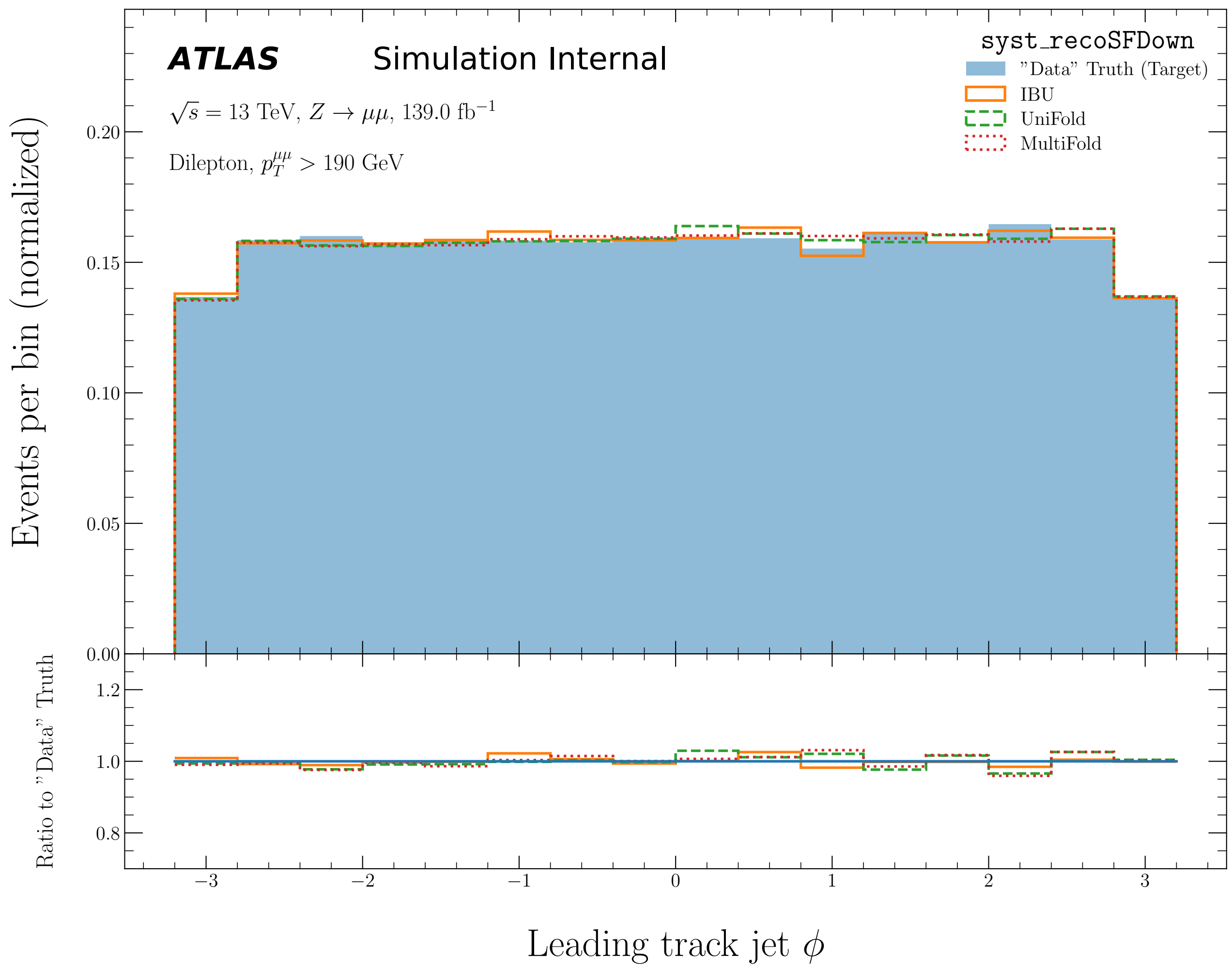












Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

**syst\_isoSFUp**

- "Data" Truth (Target)
- IBU
- UniFold
- MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

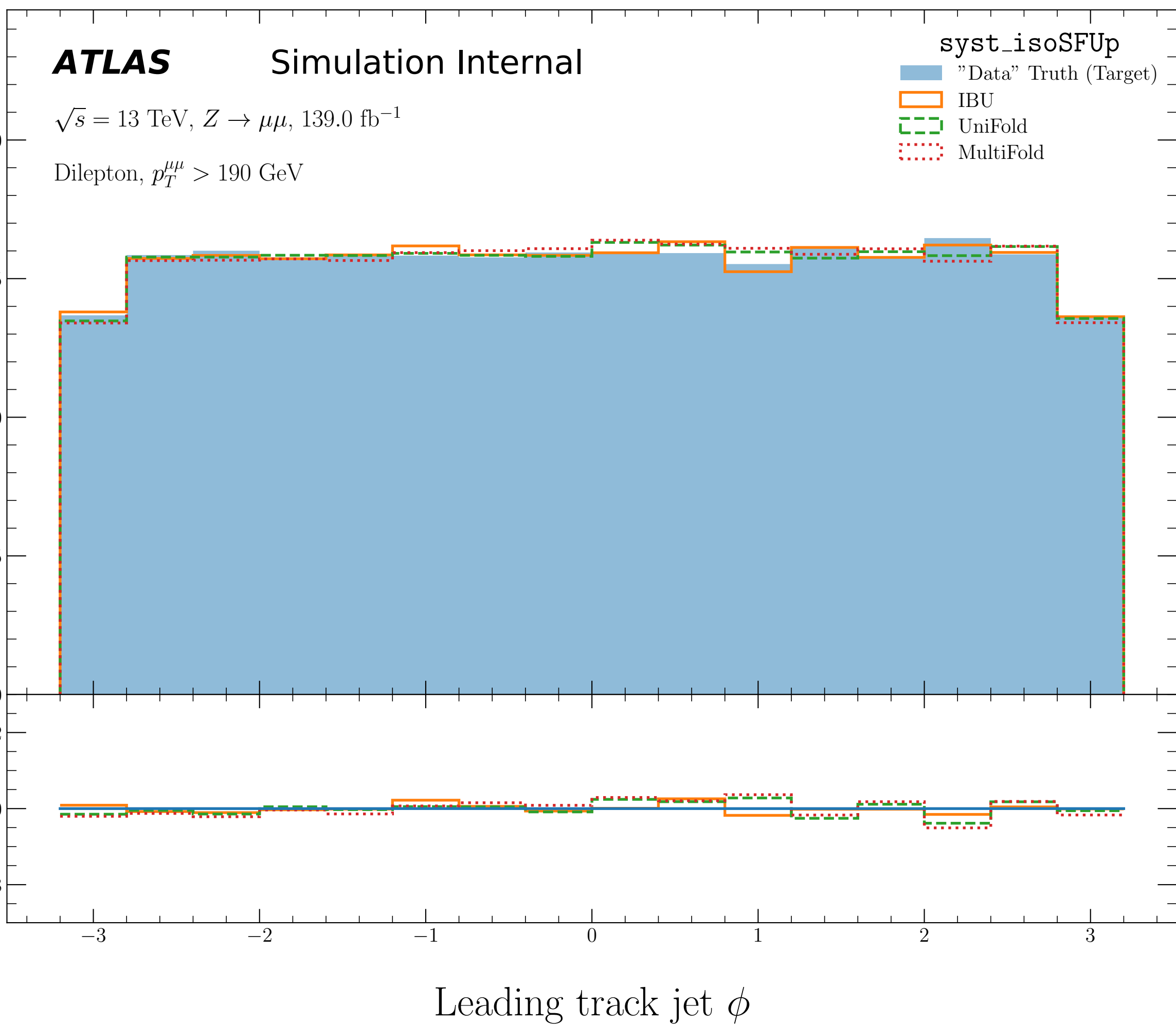
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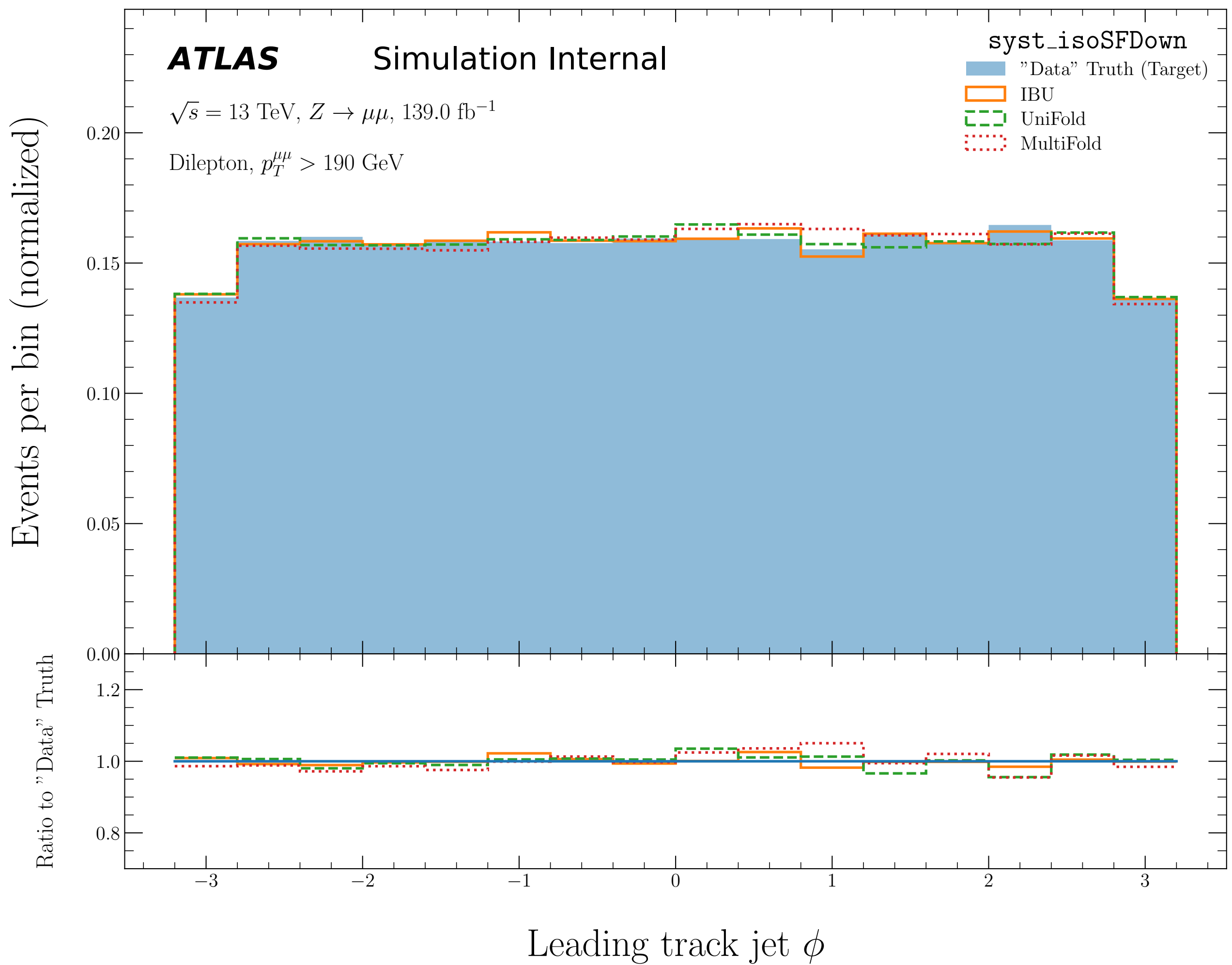
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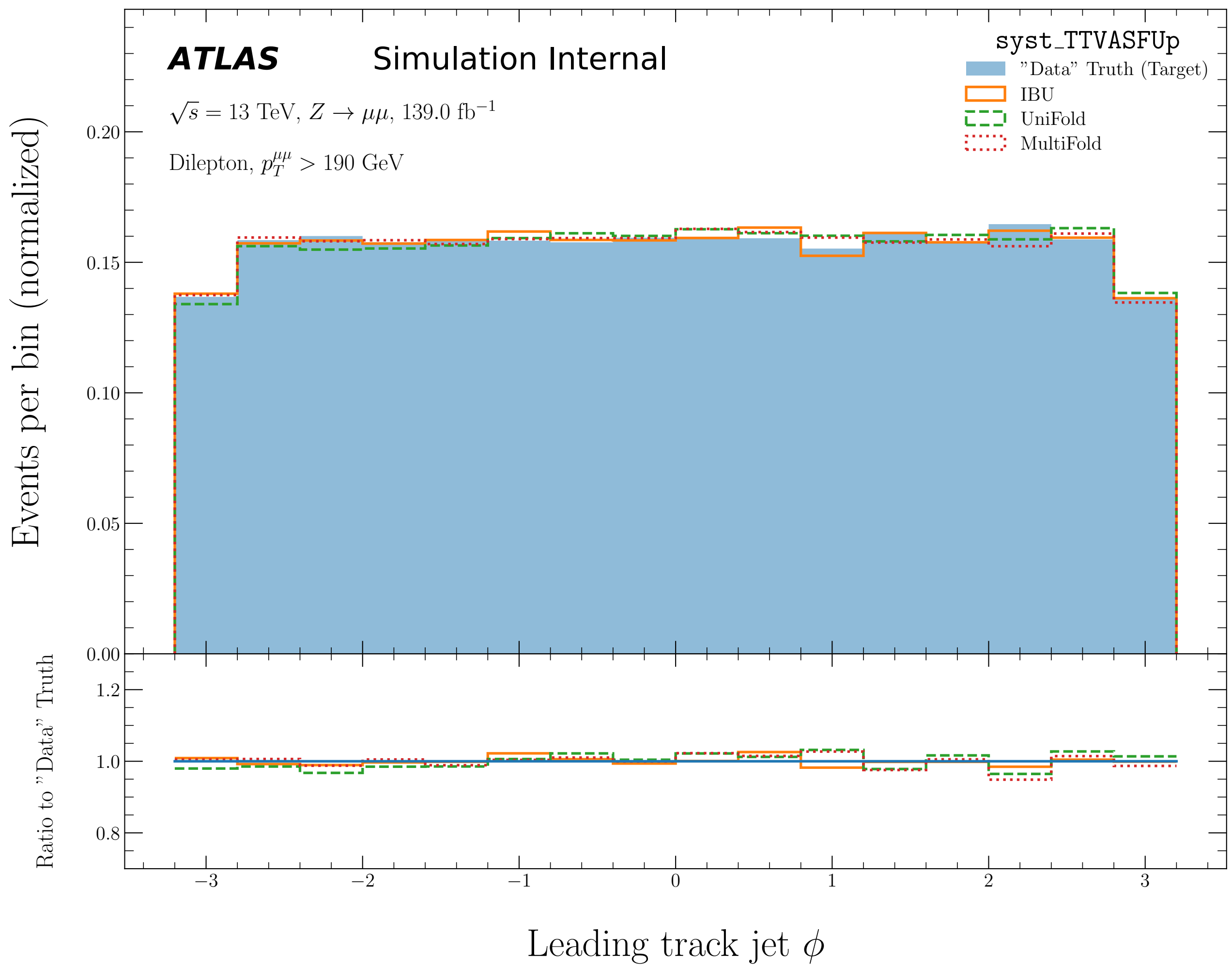
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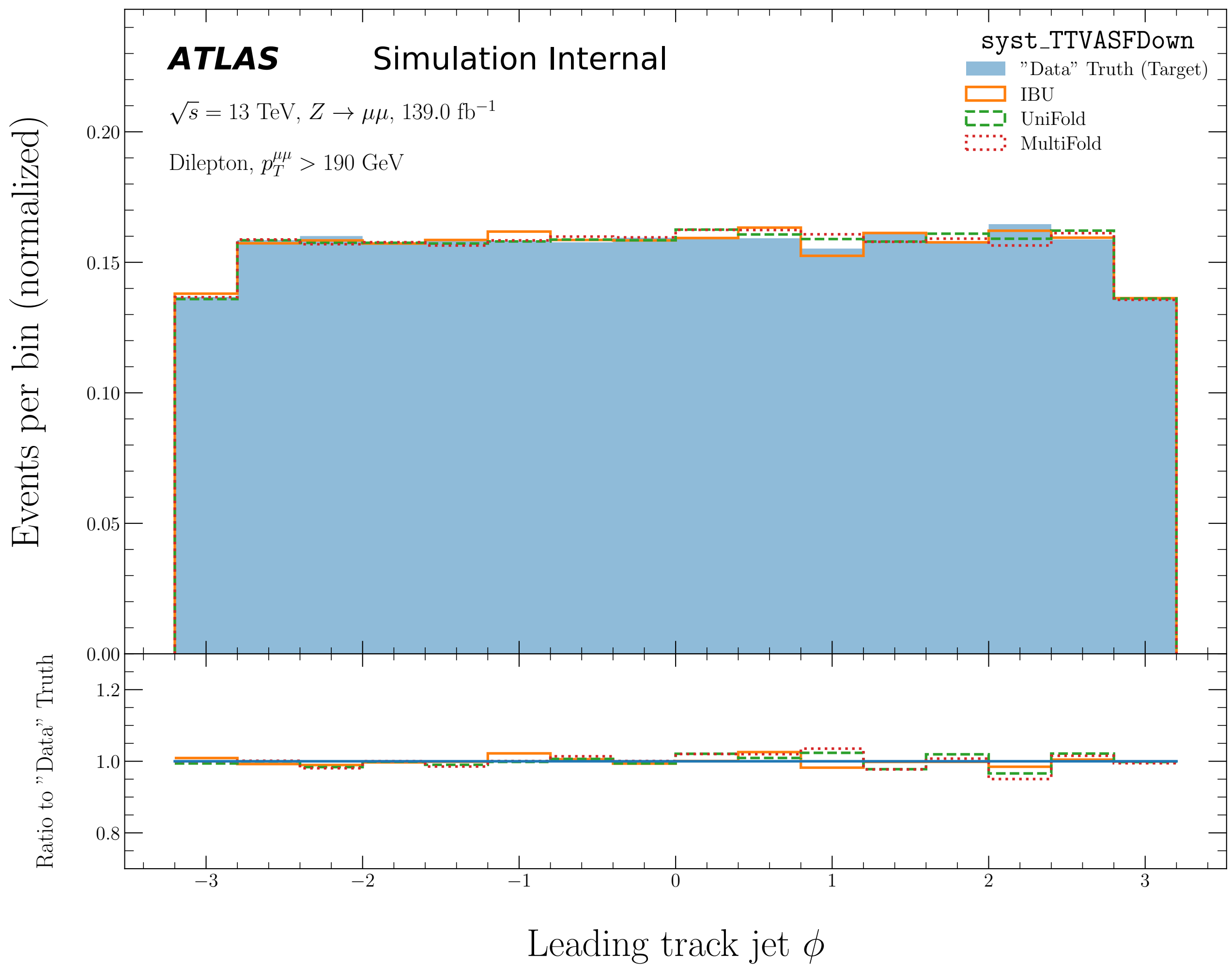
3

Leading track jet  $\phi$











Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_trigSFUp

"Data" Truth (Target)

IBU

UniFold

MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

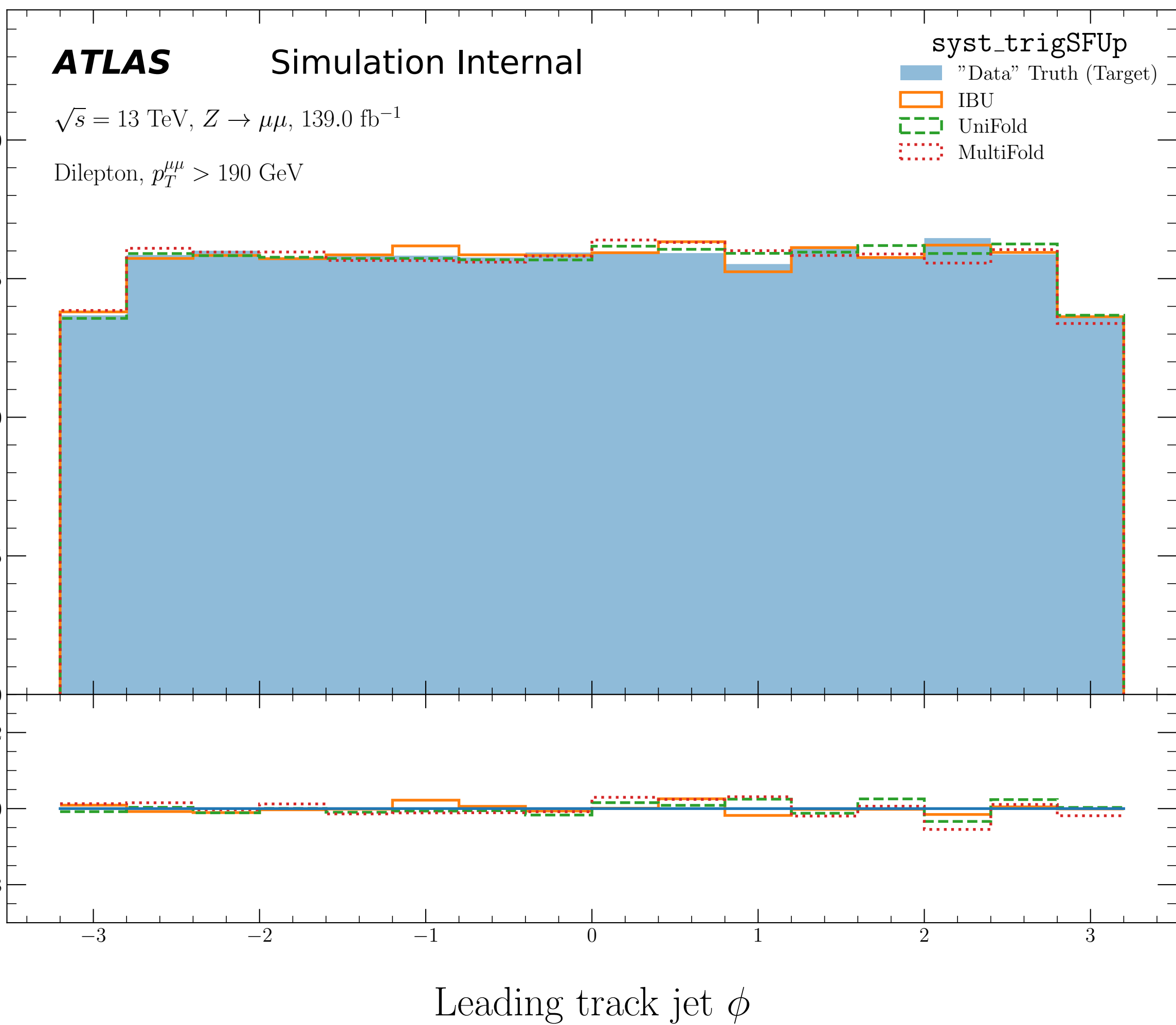
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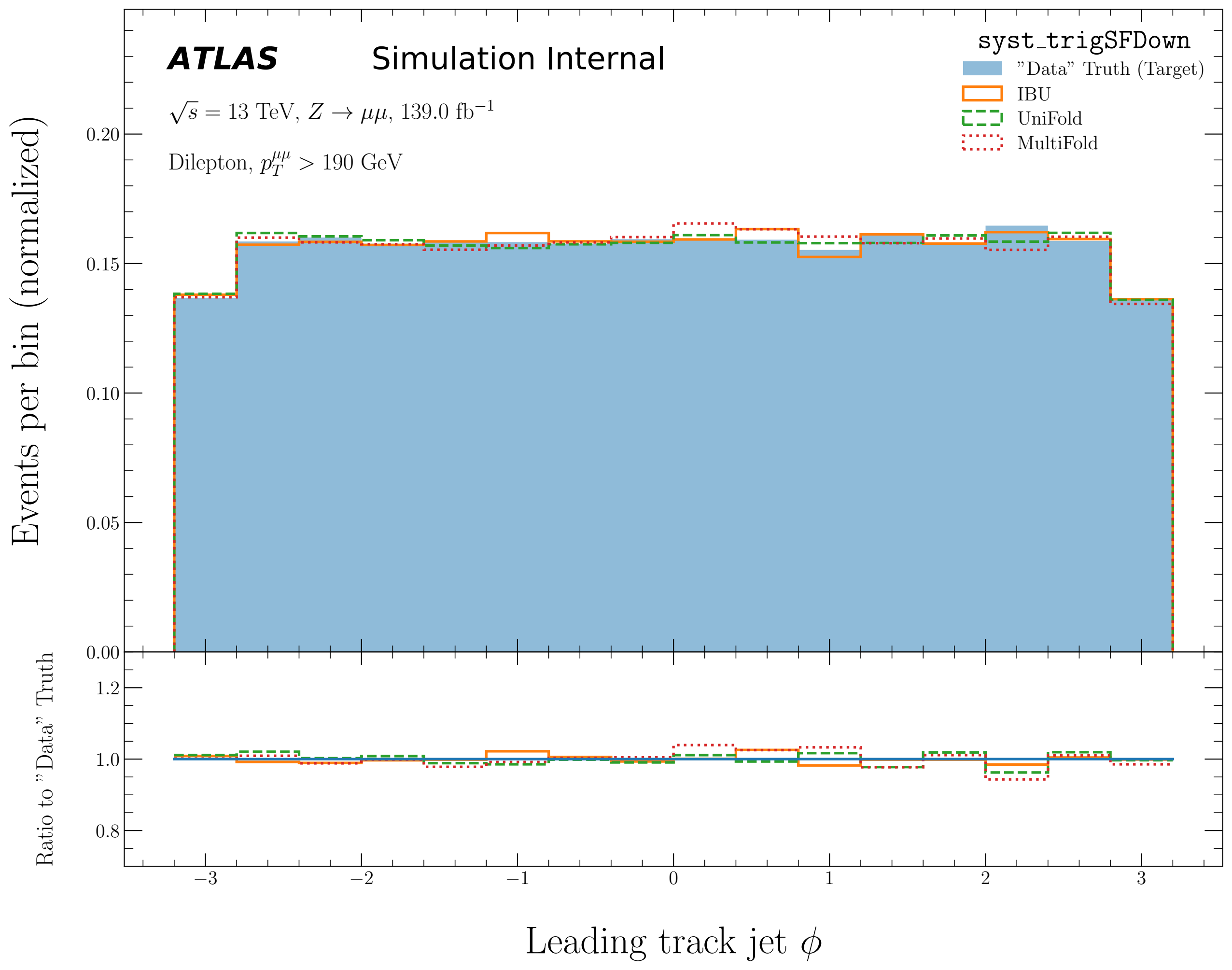
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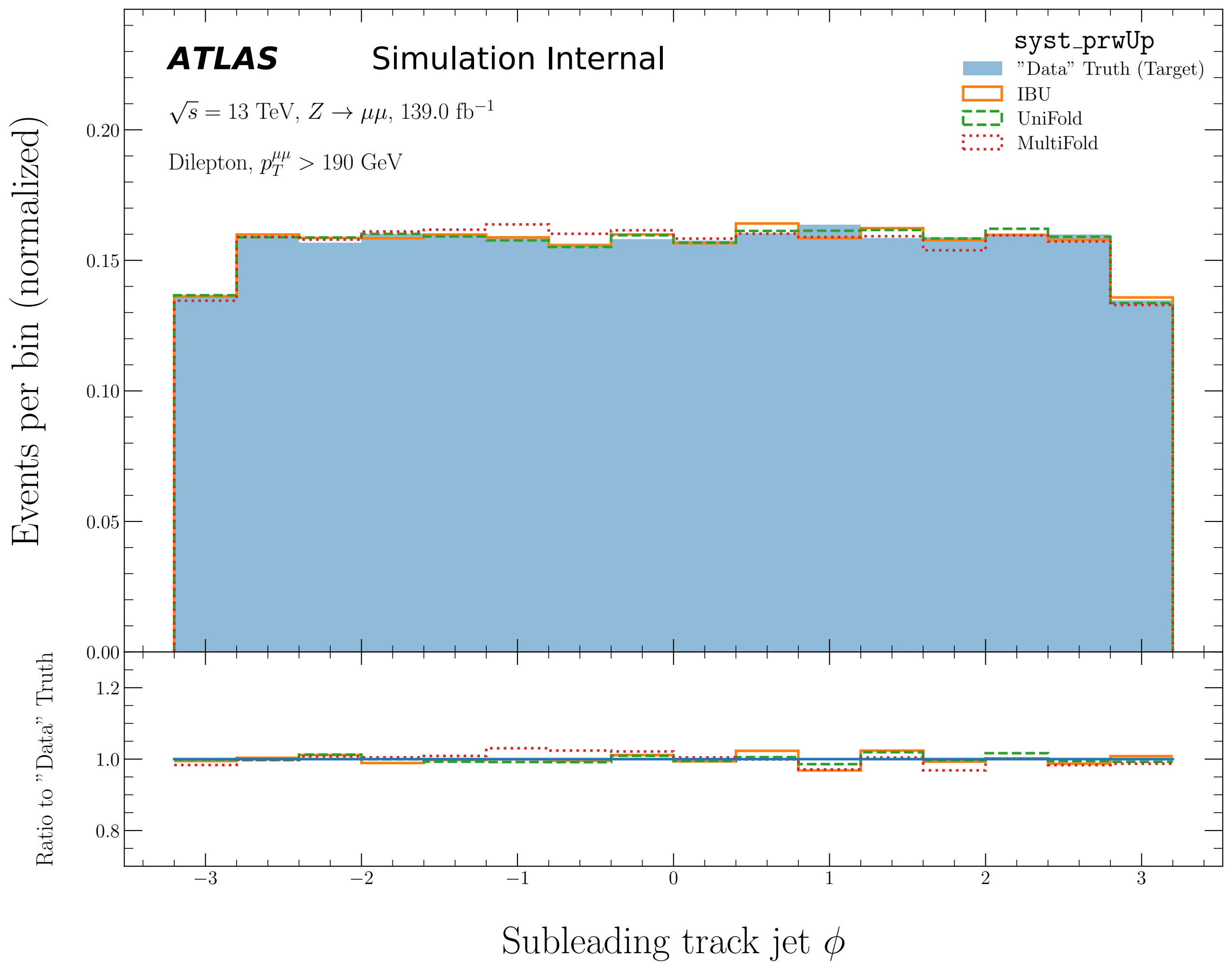
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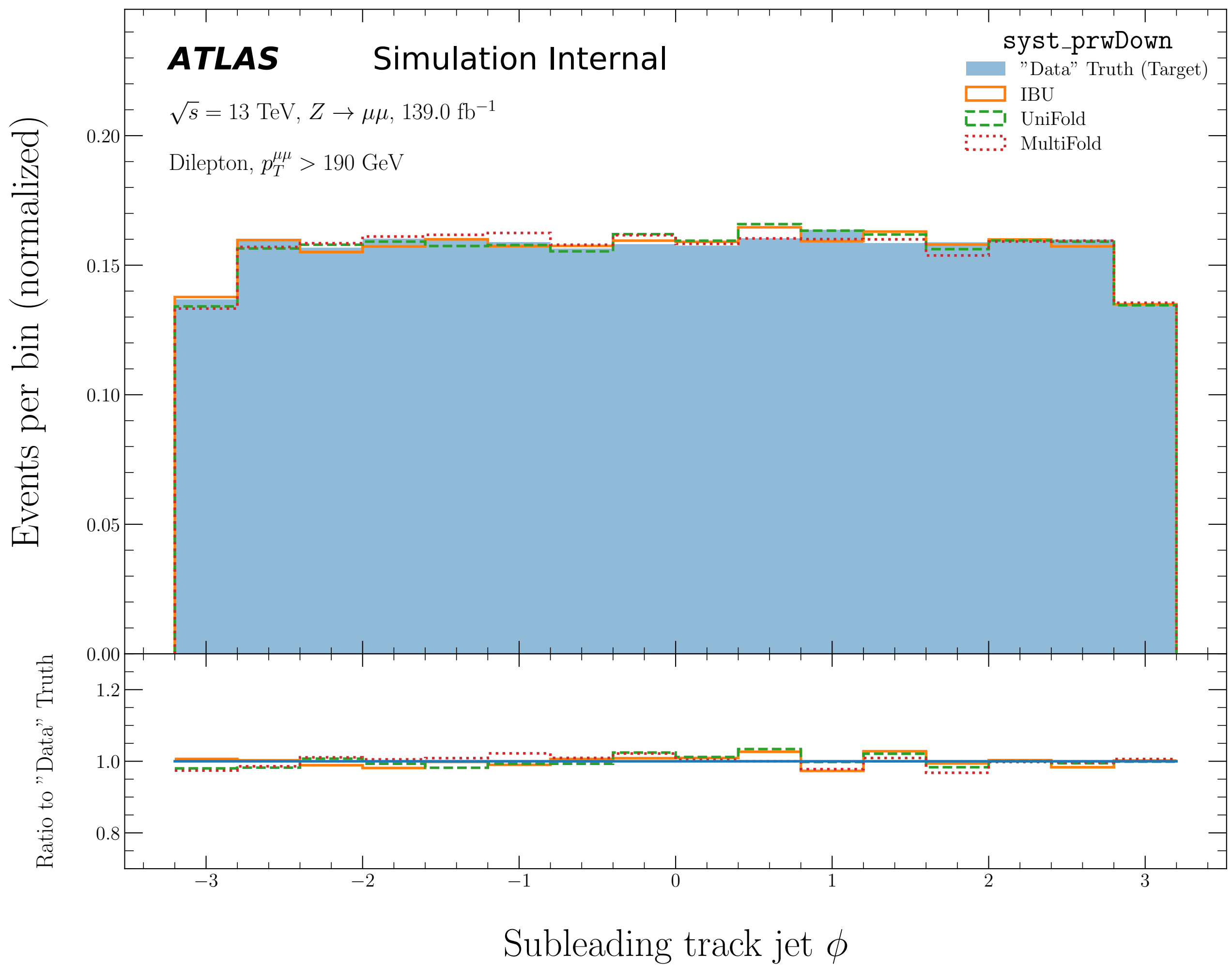
3

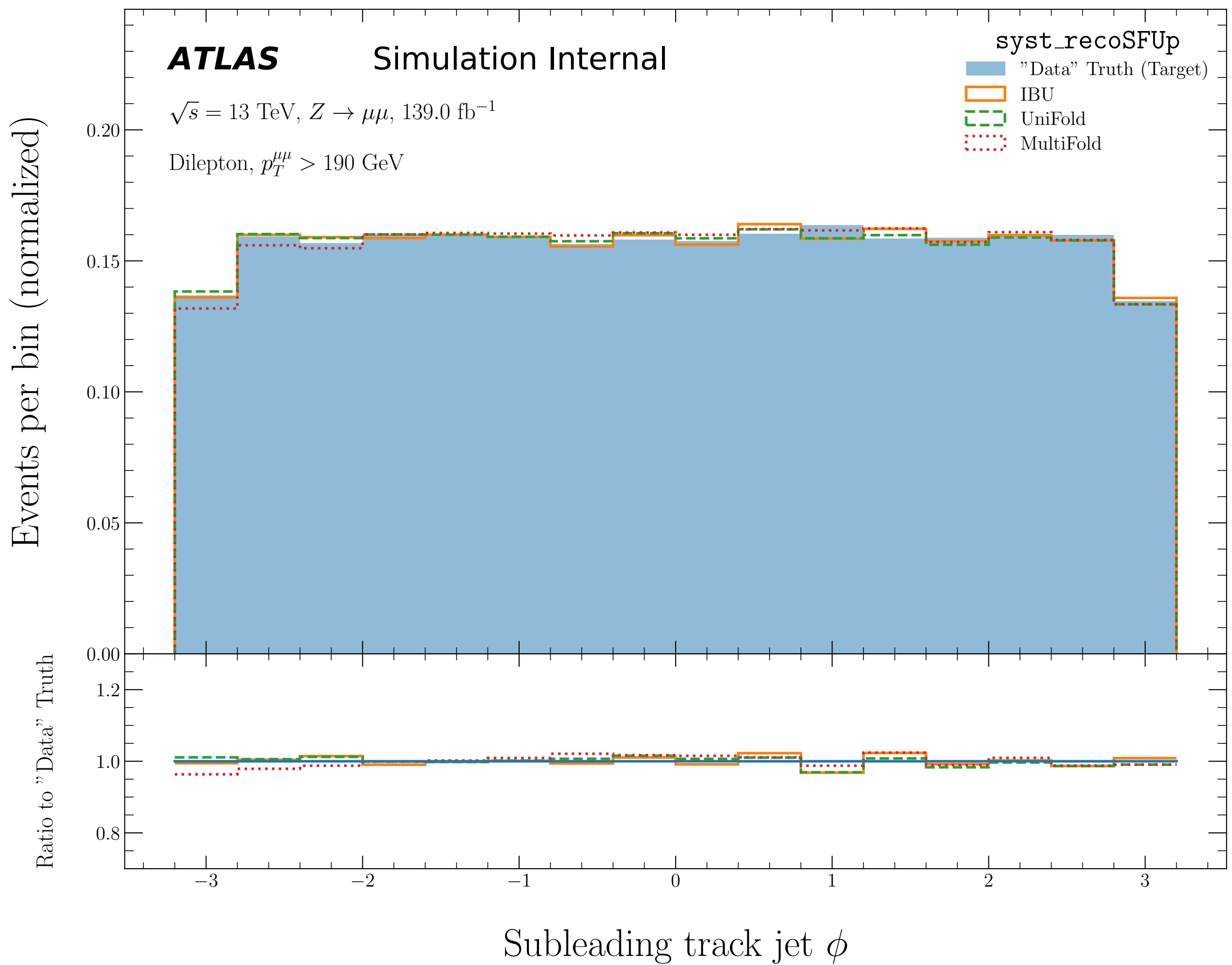
Leading track jet  $\phi$

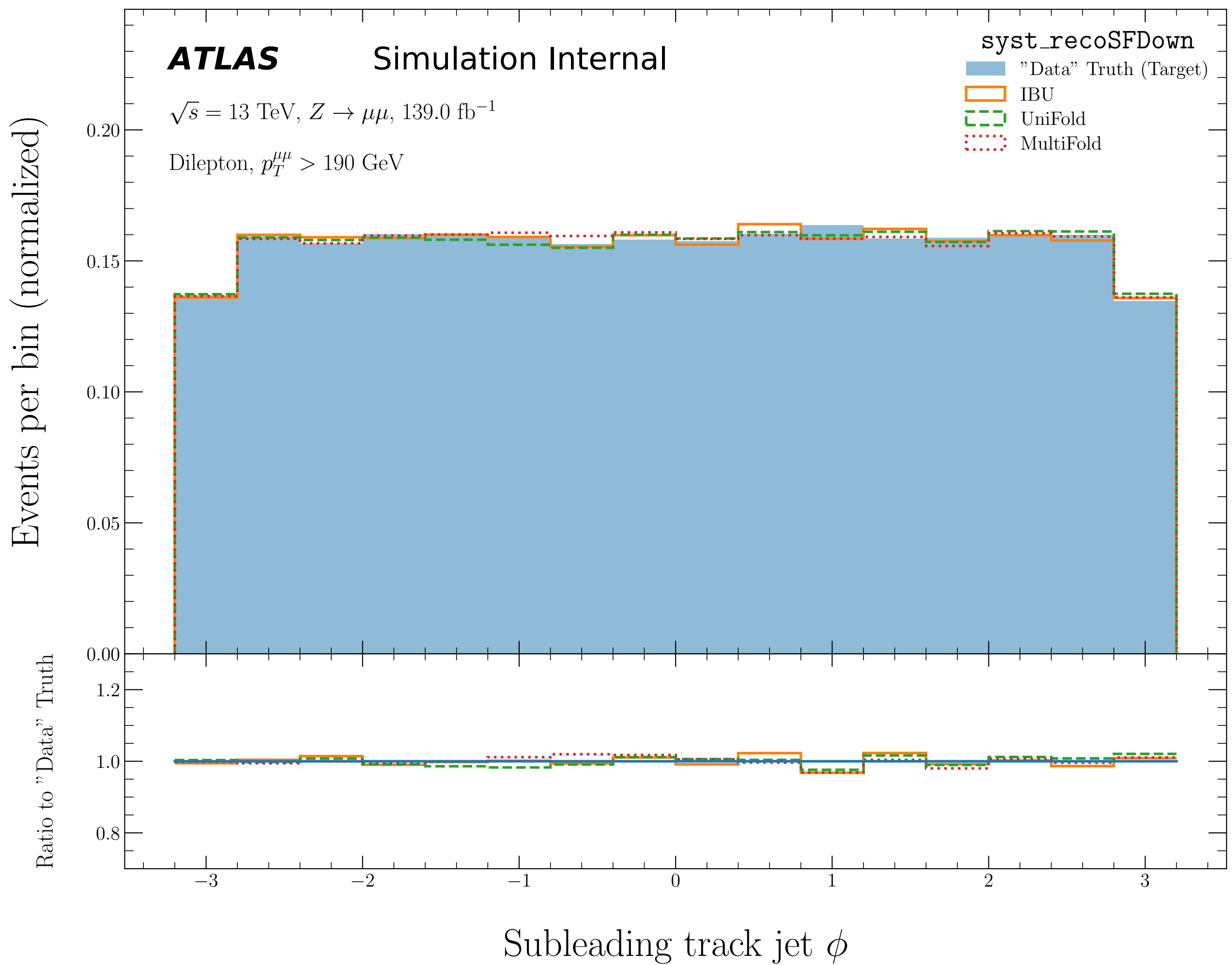


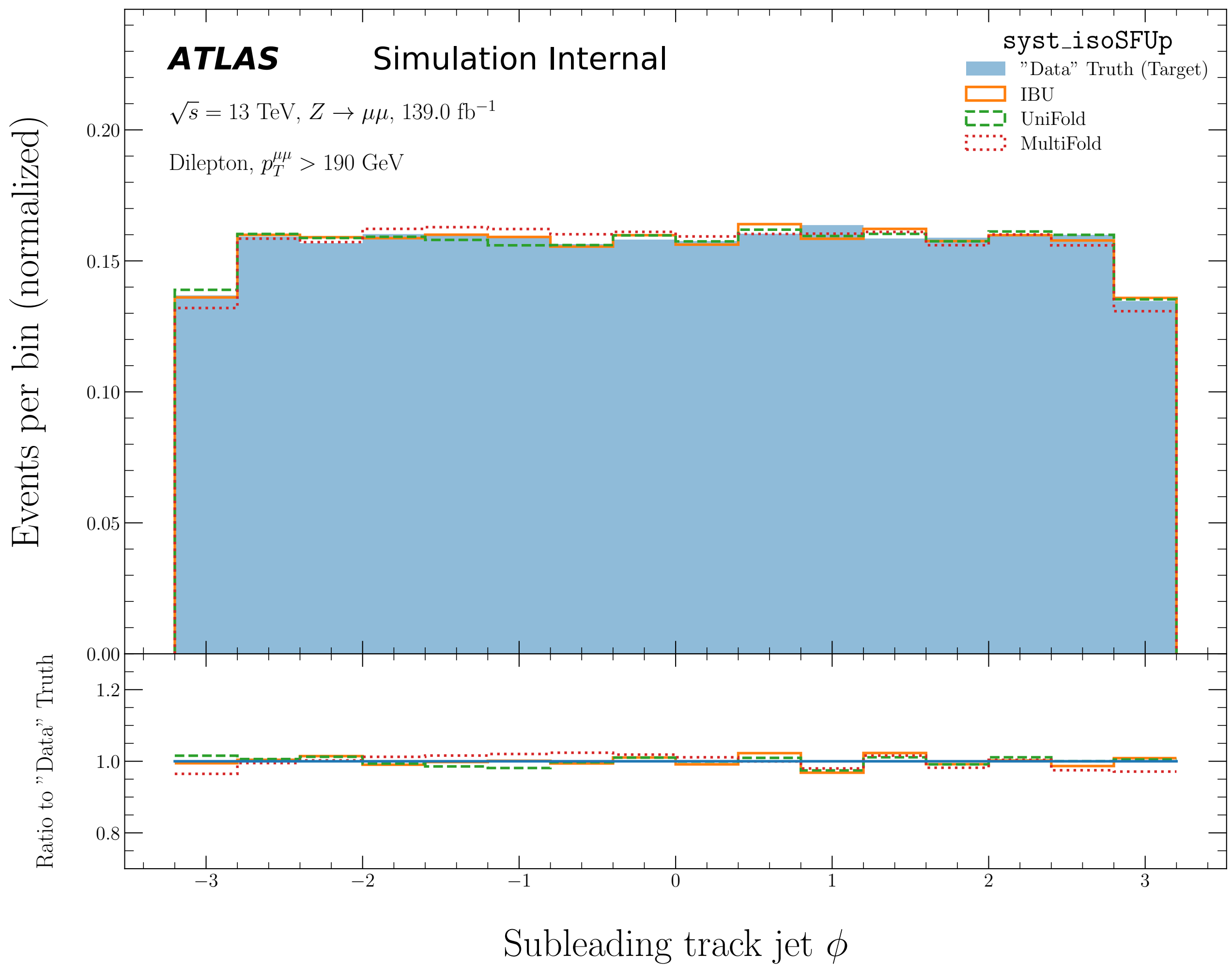


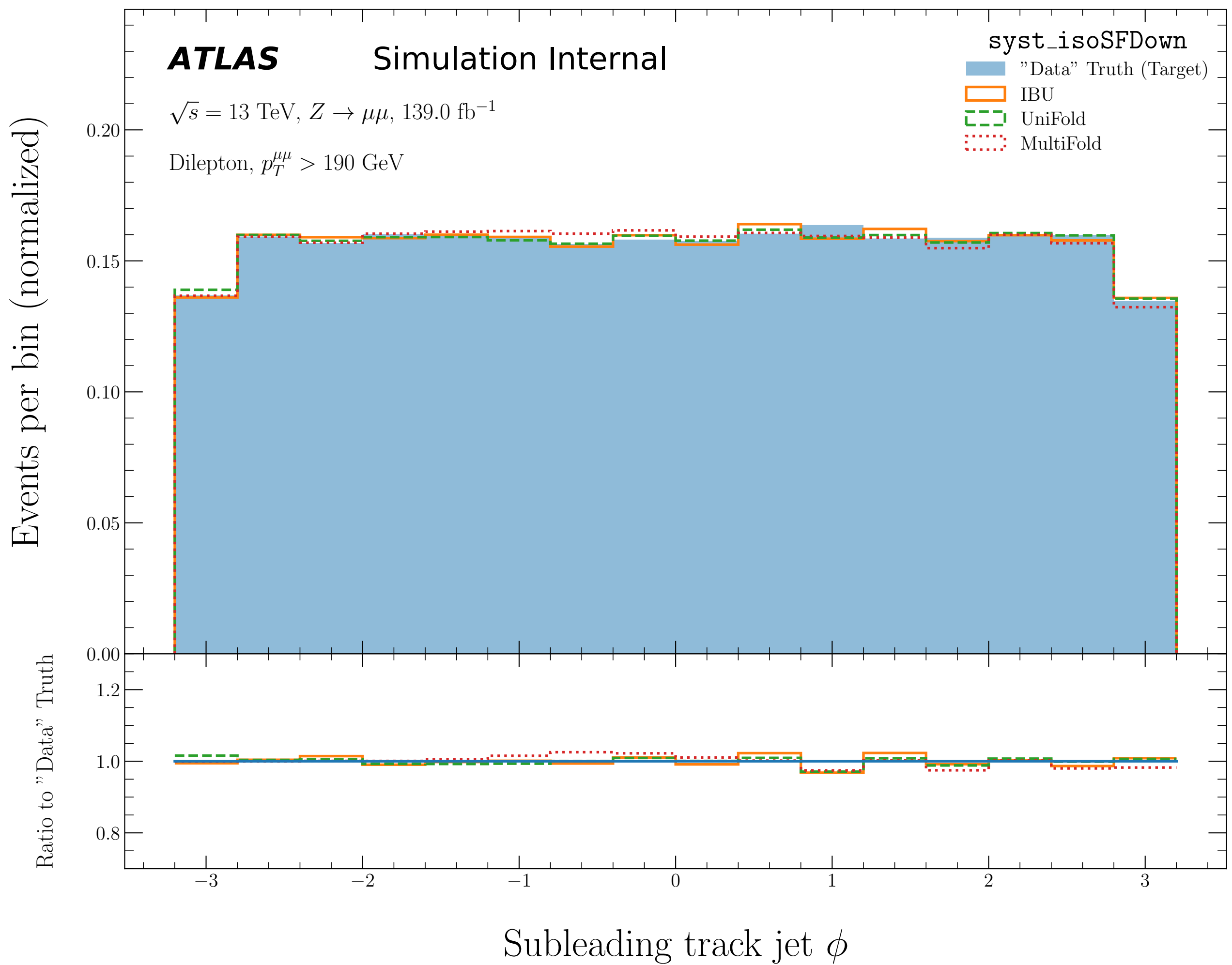




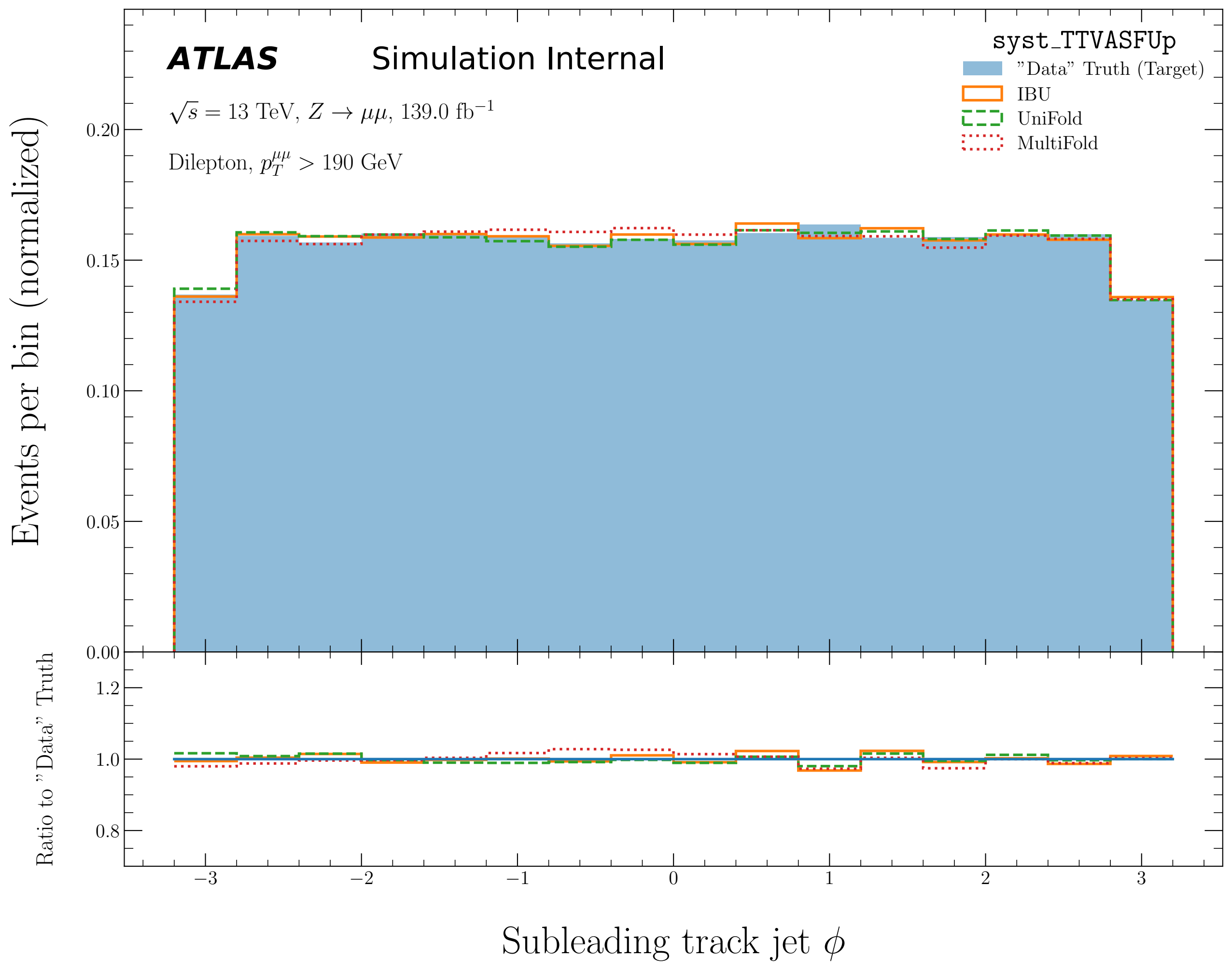


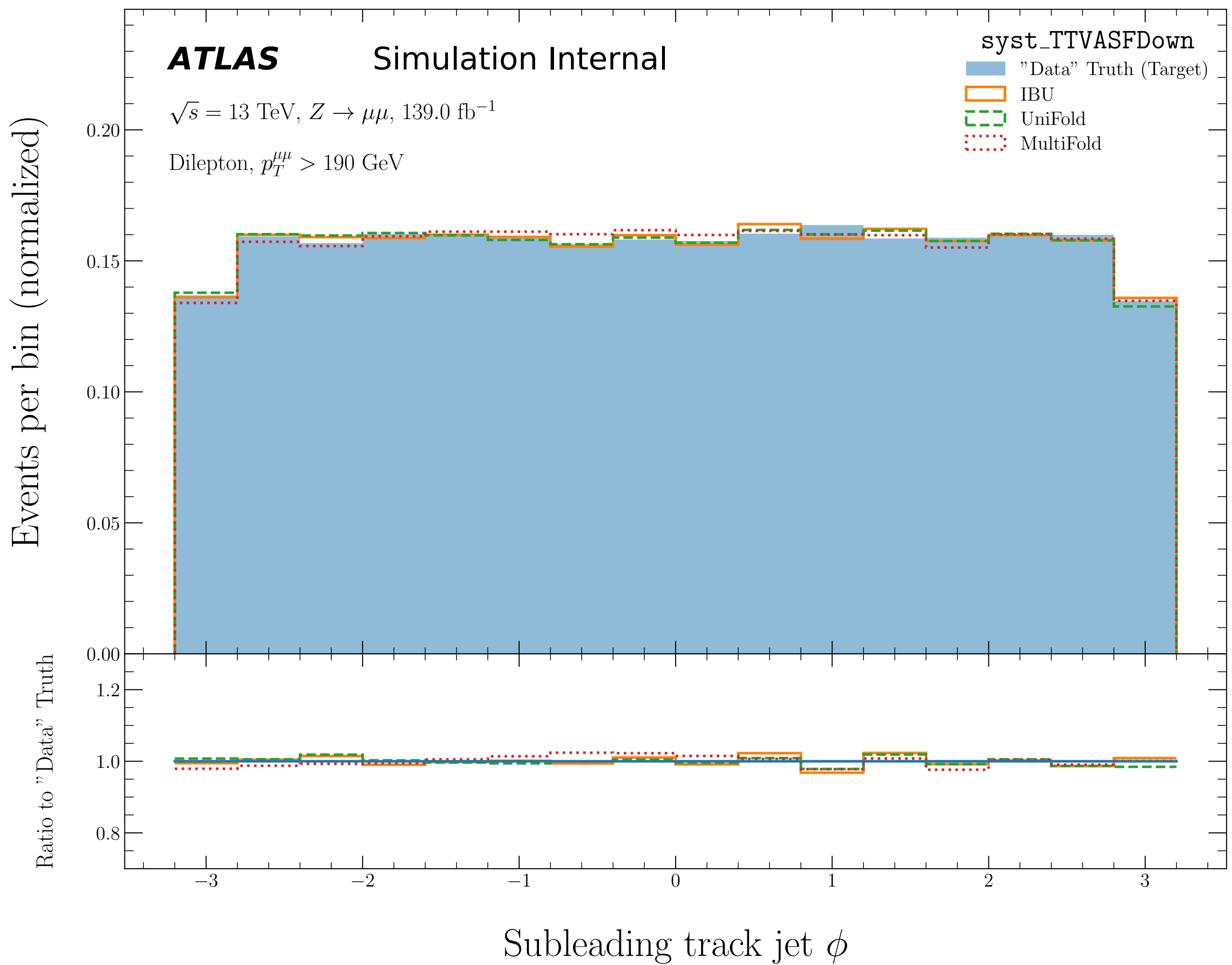


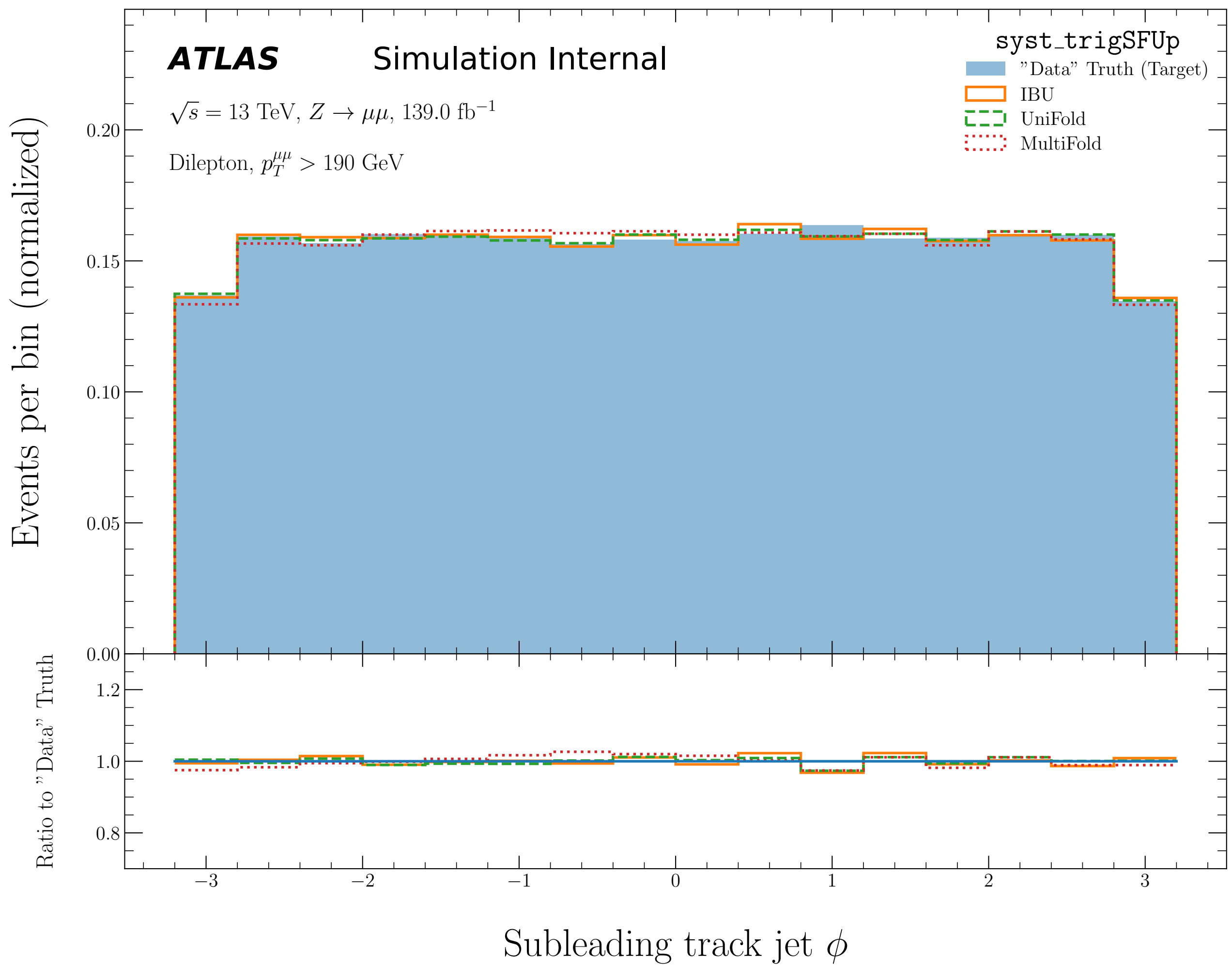


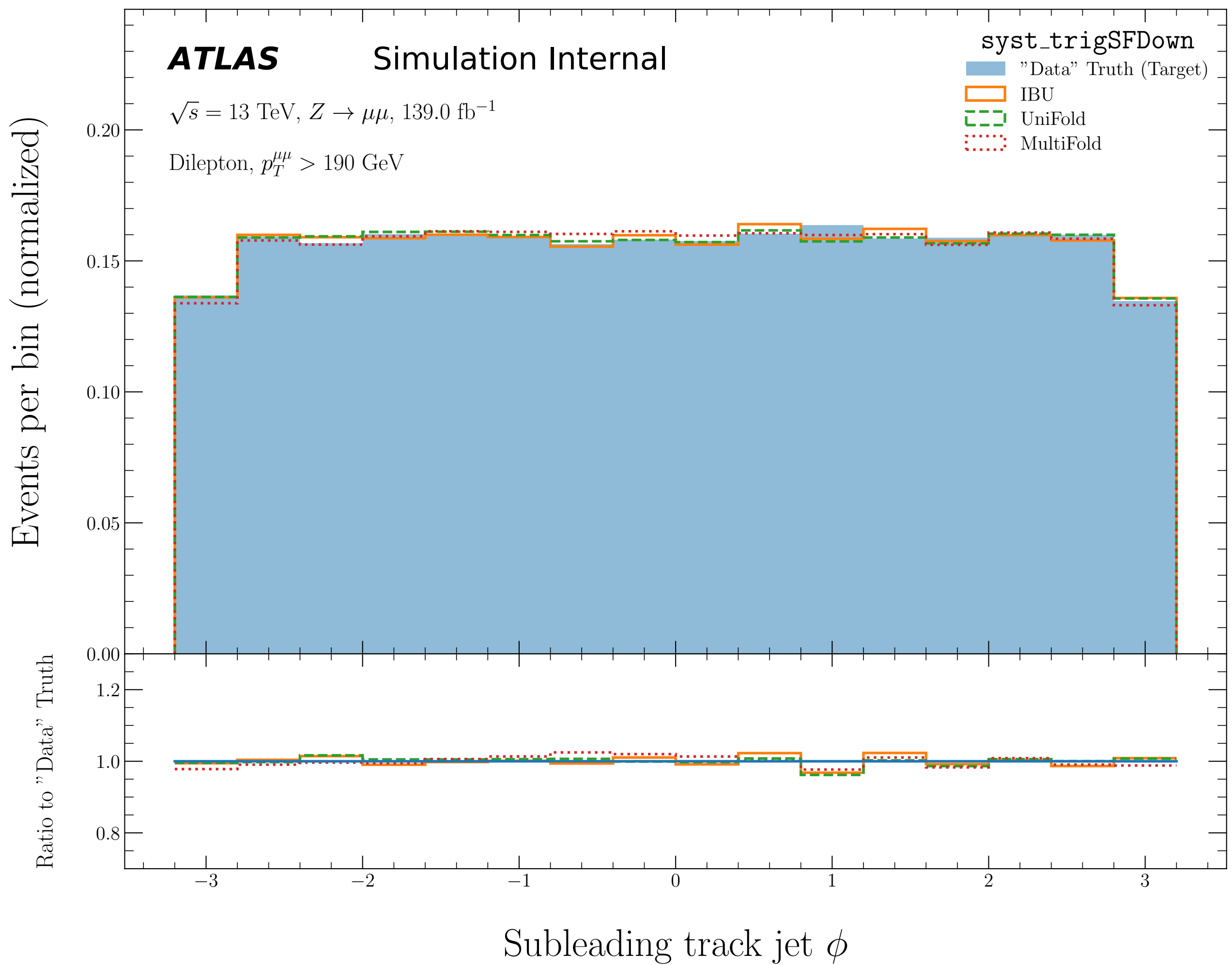


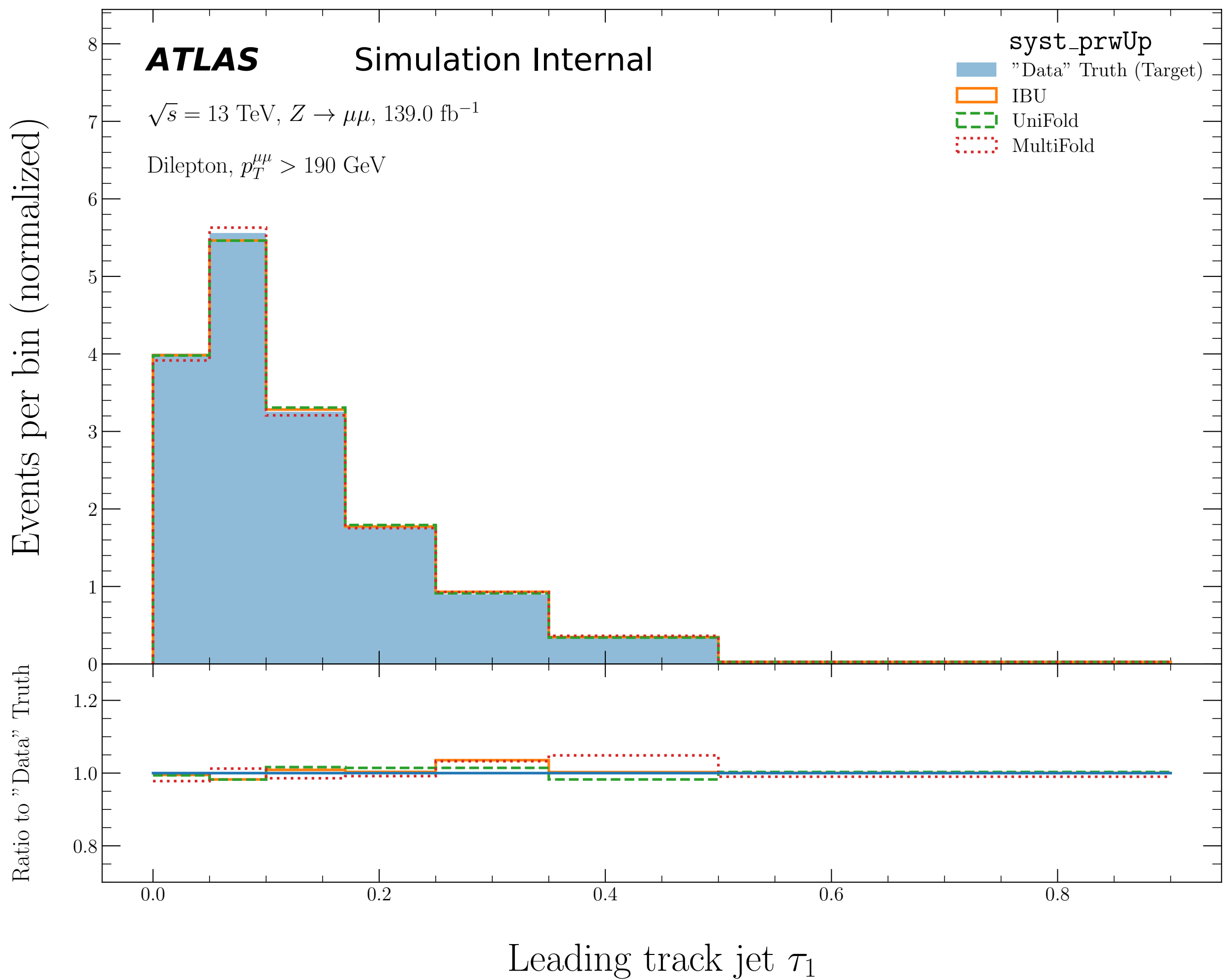


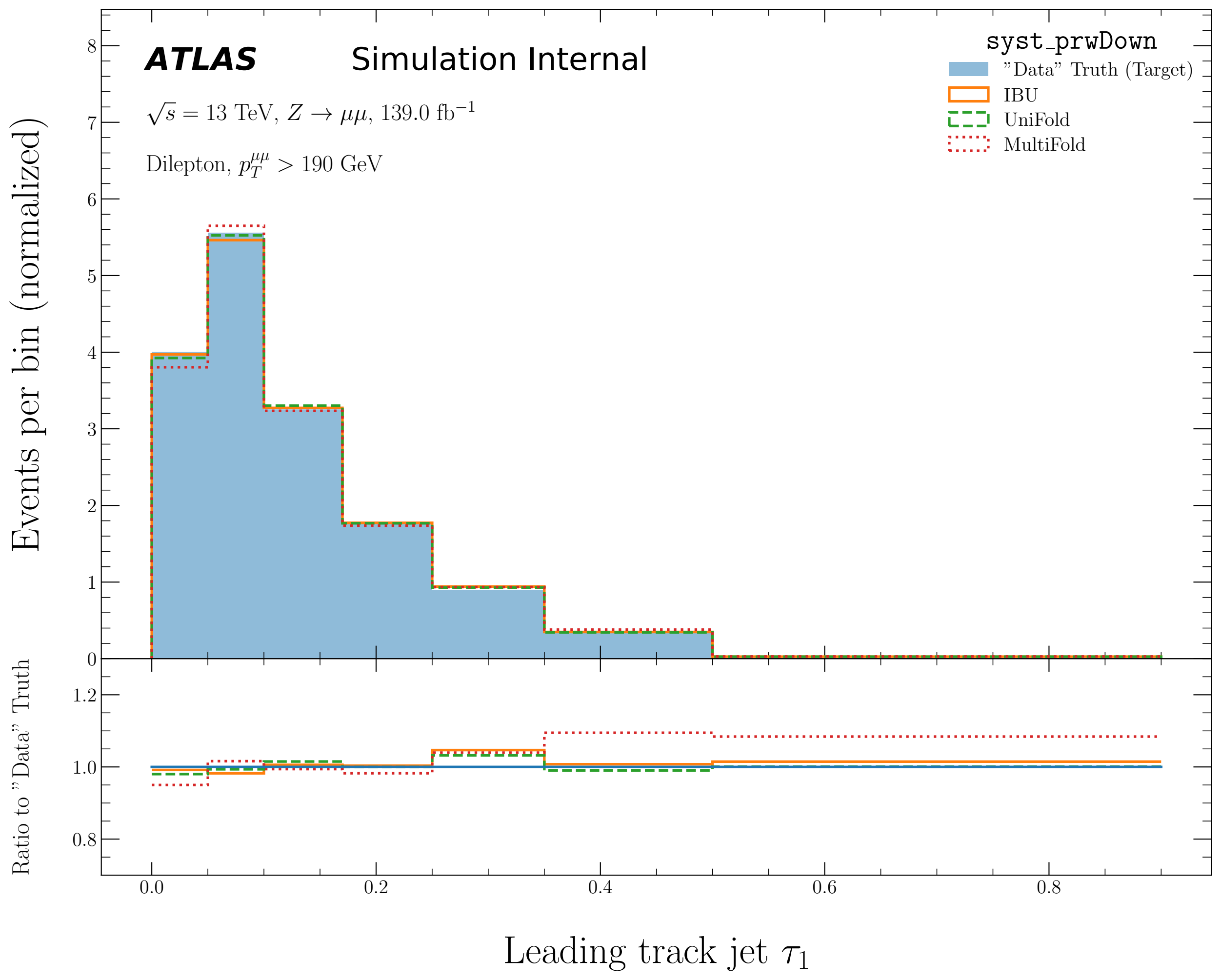


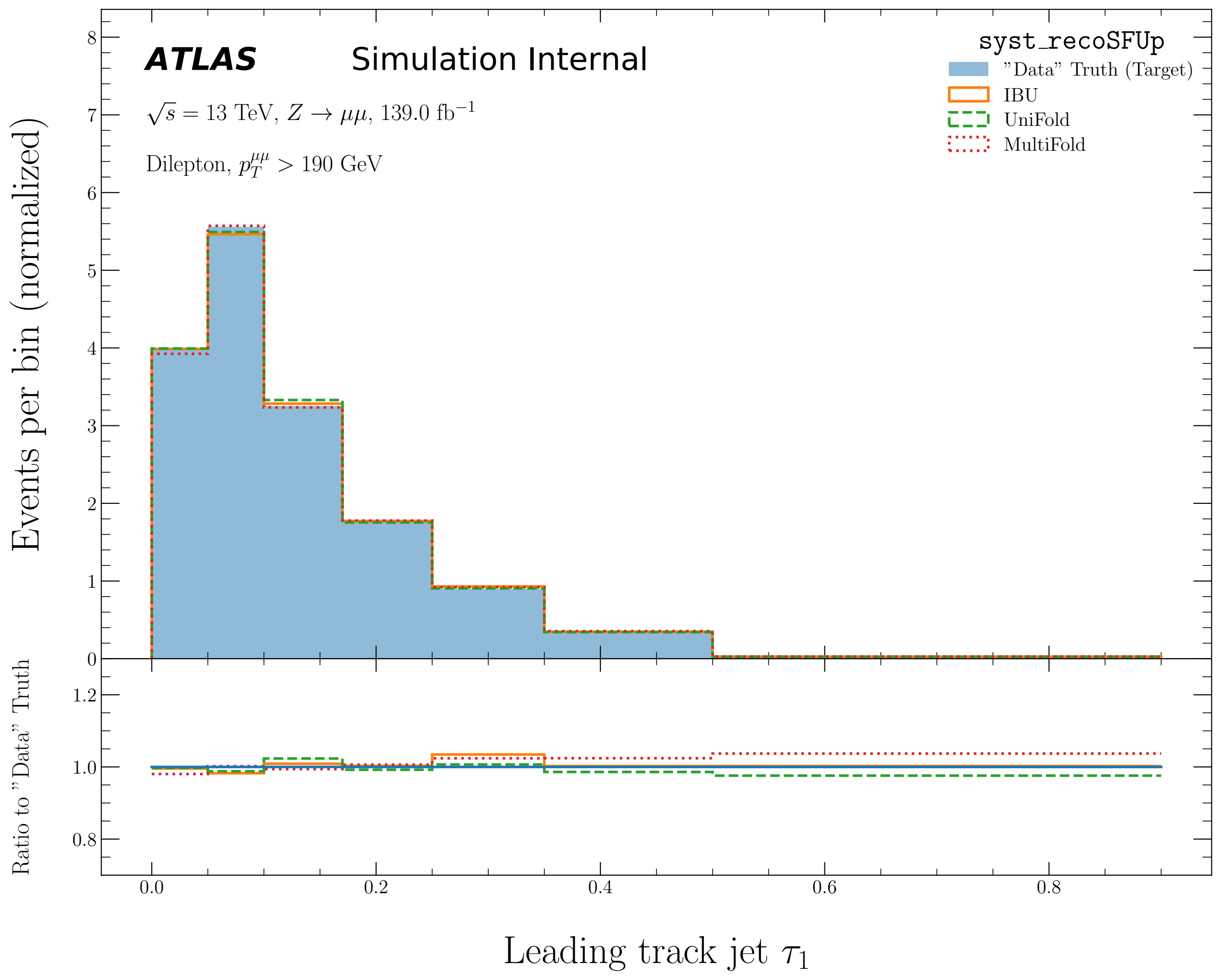


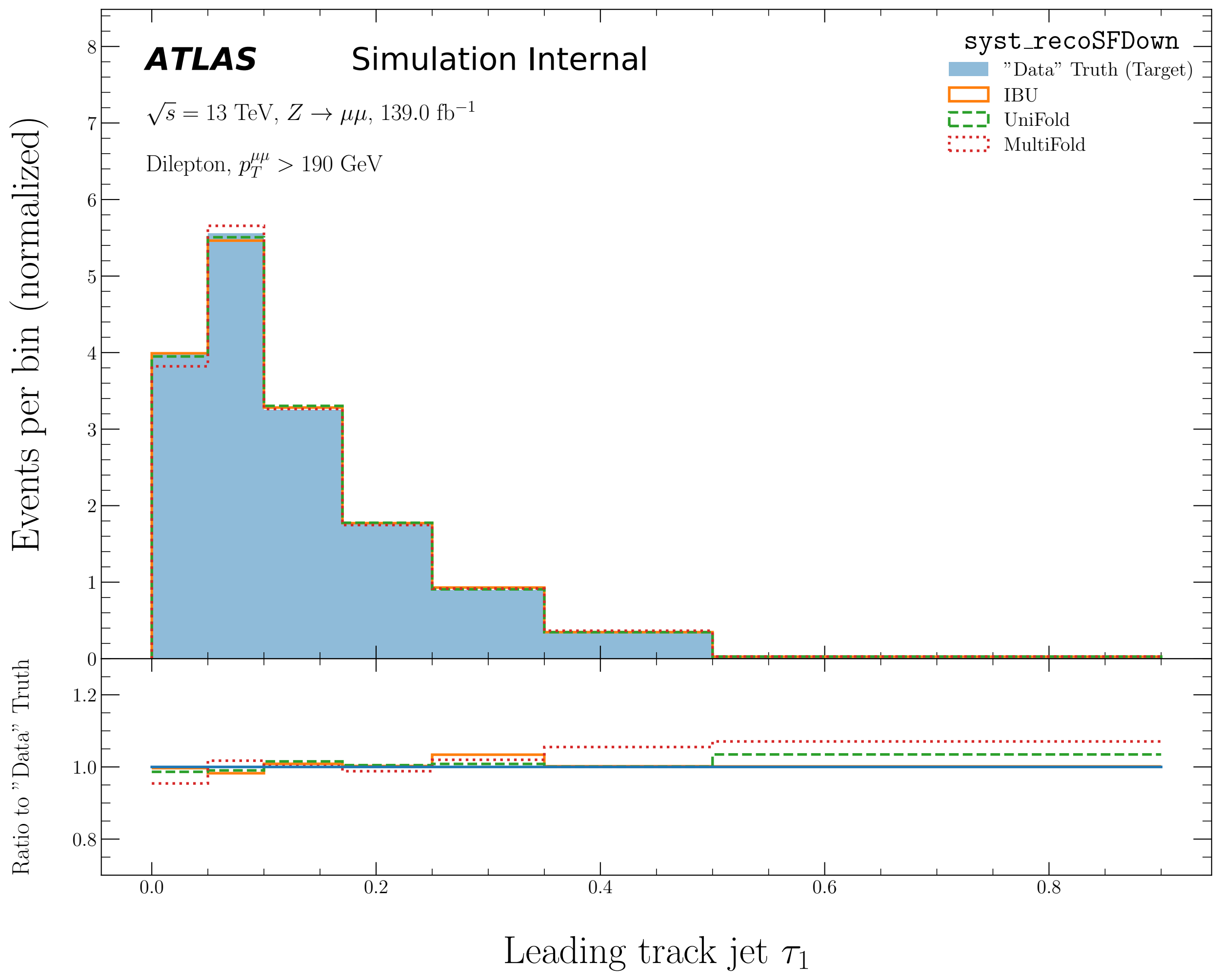




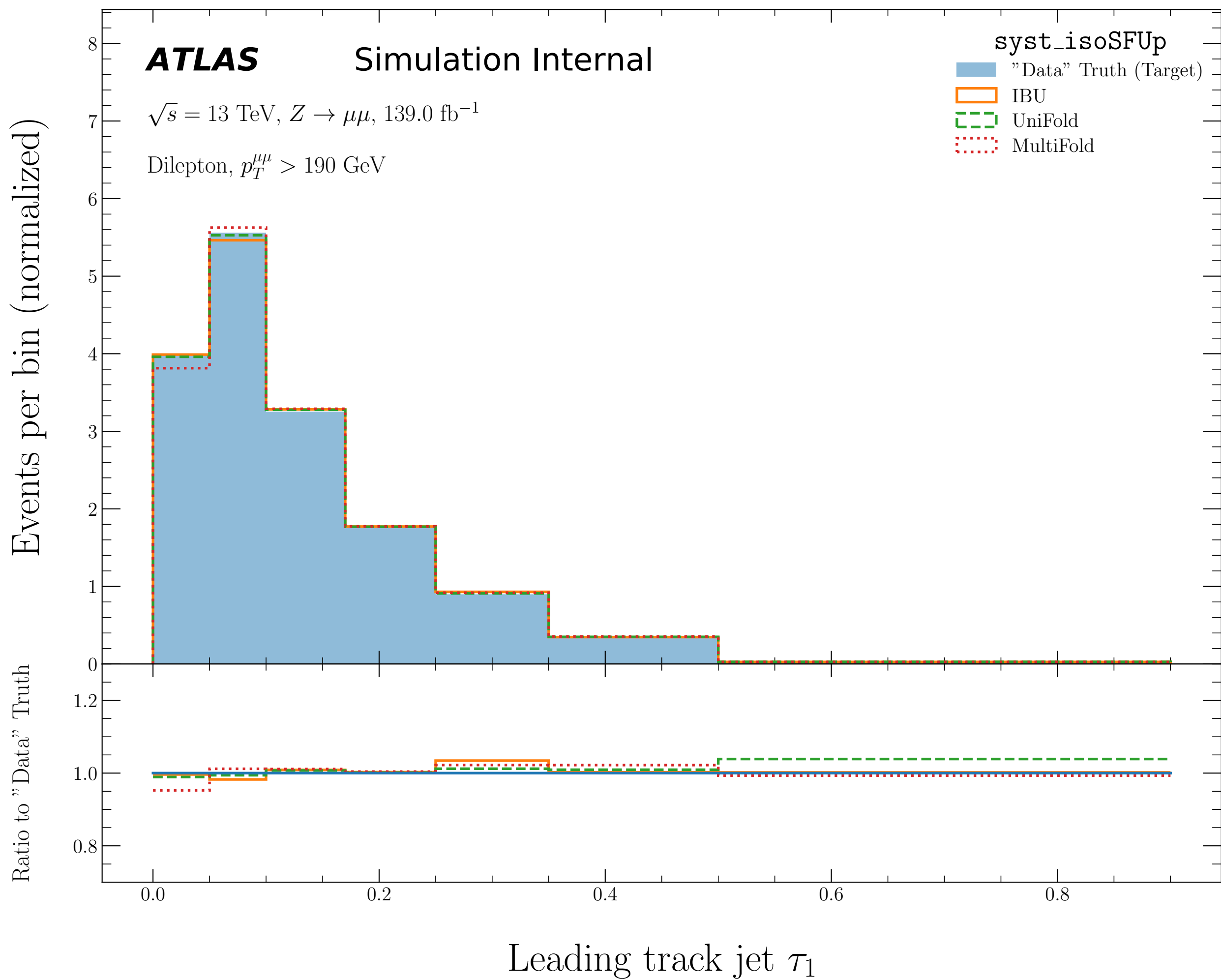


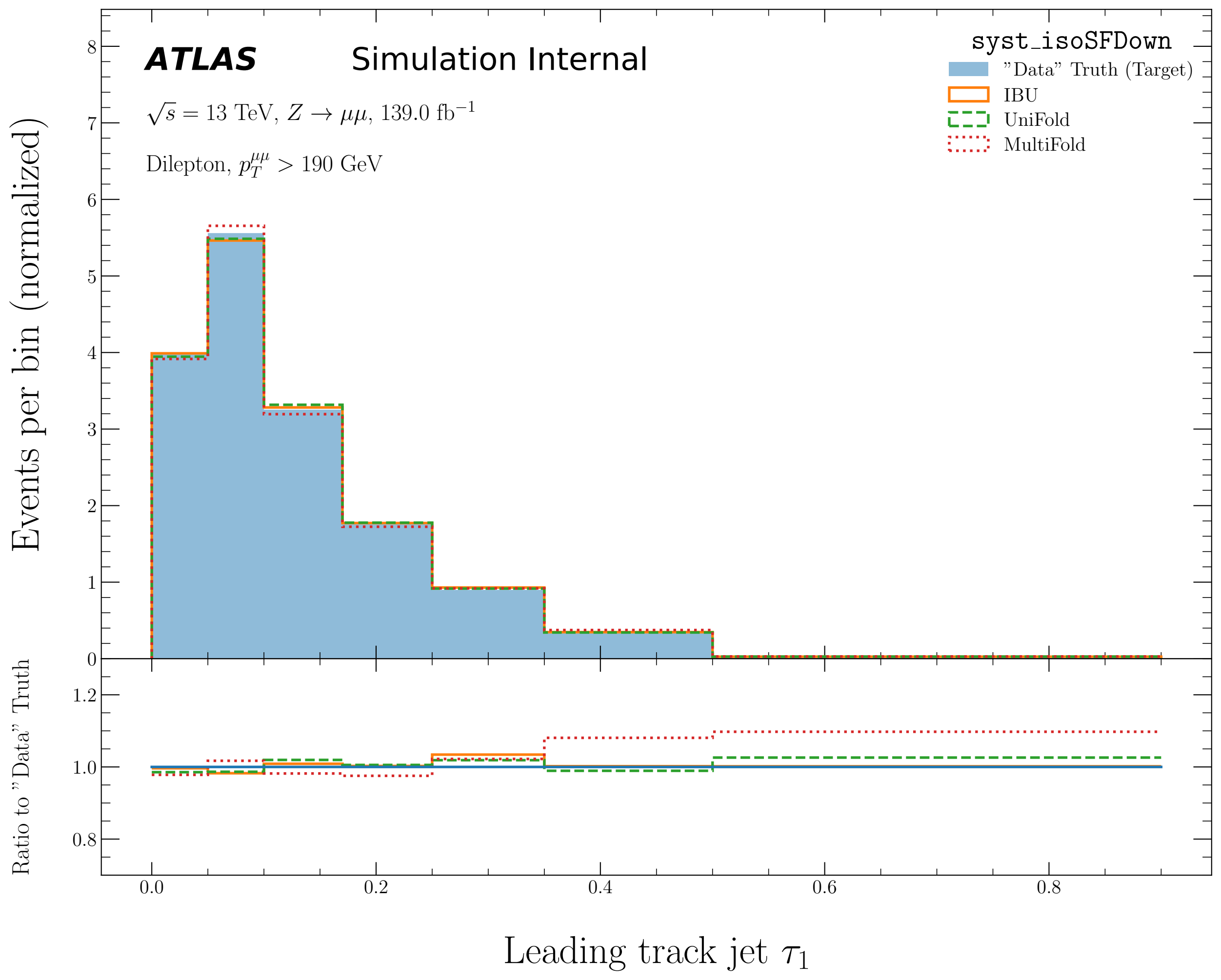


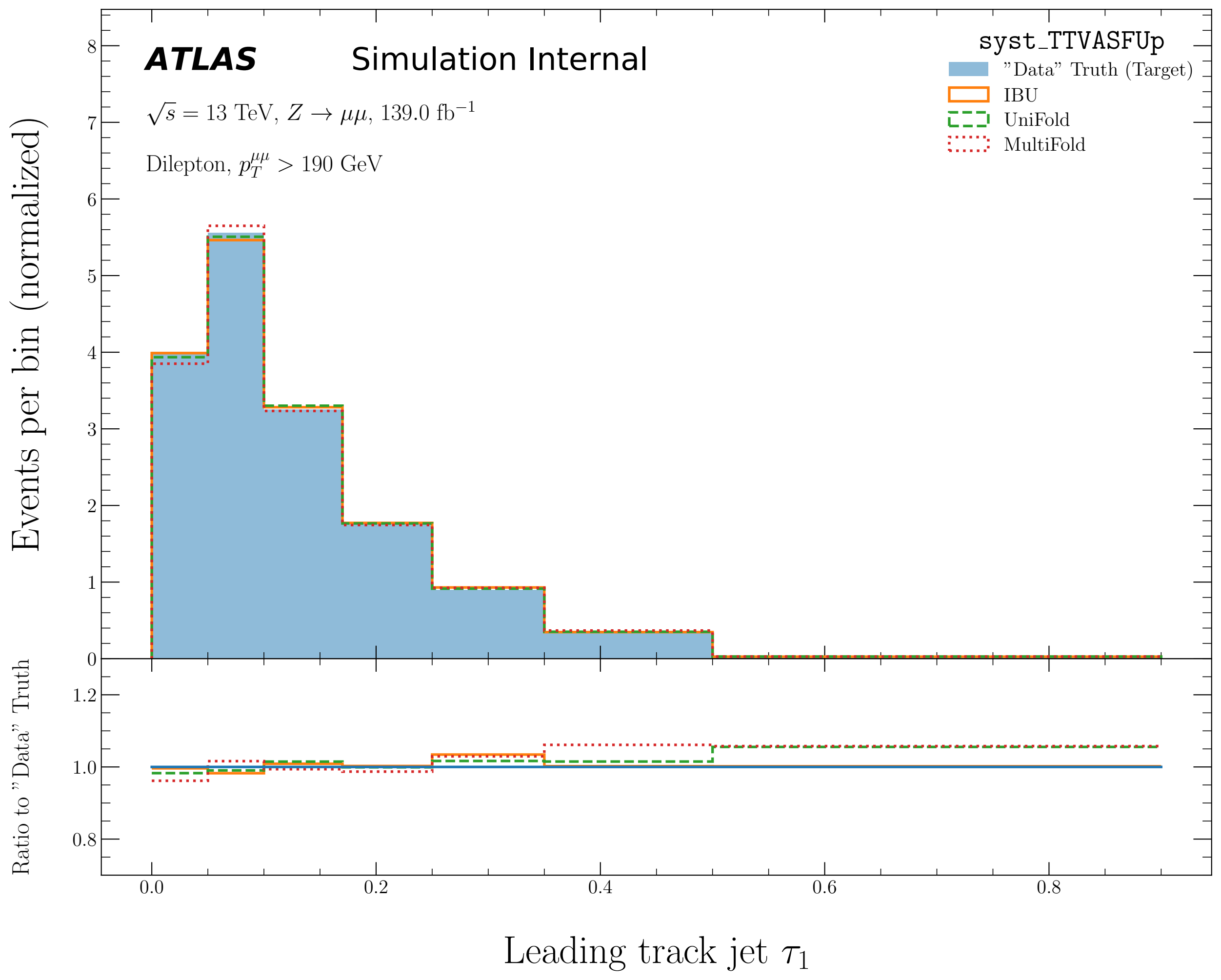


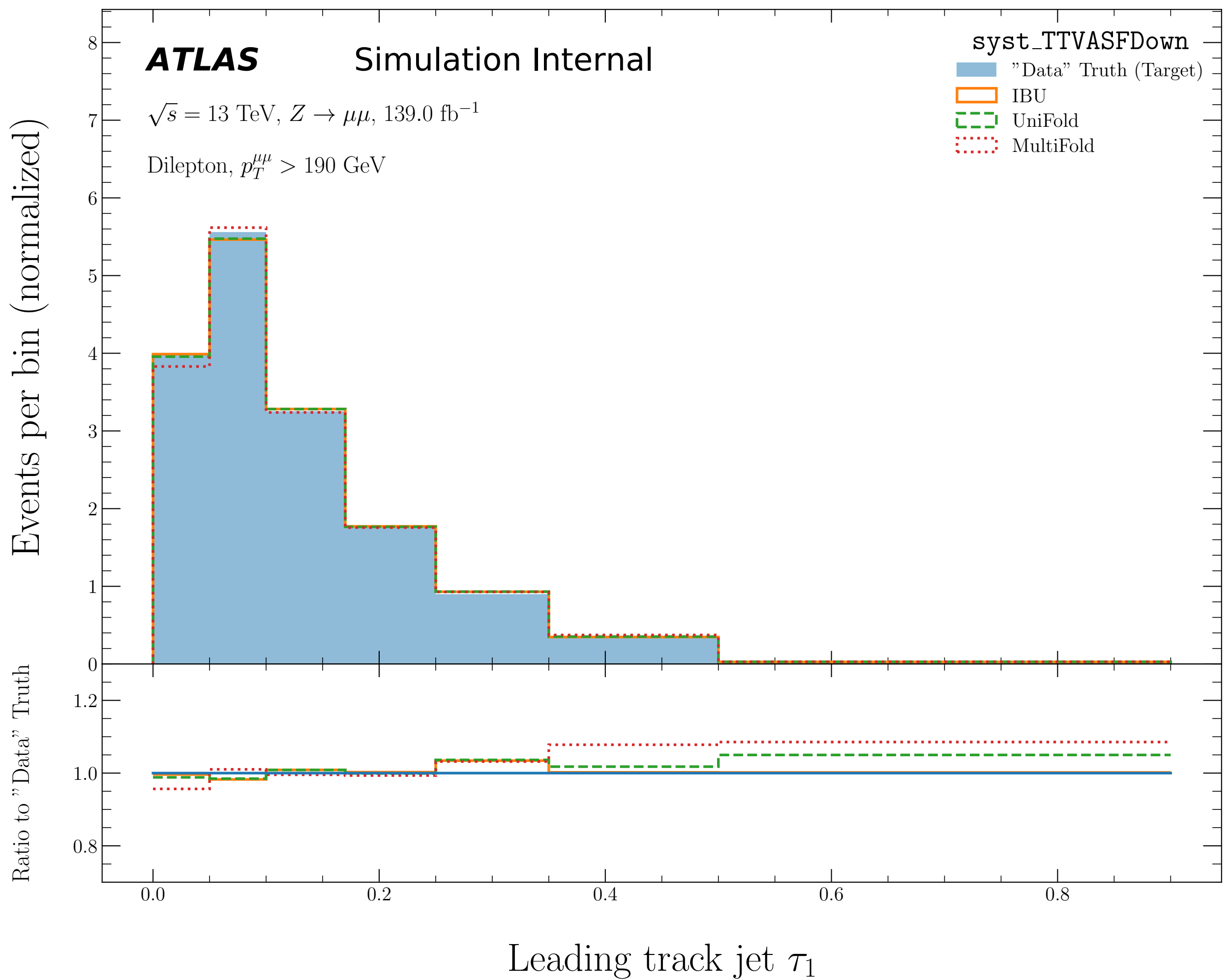


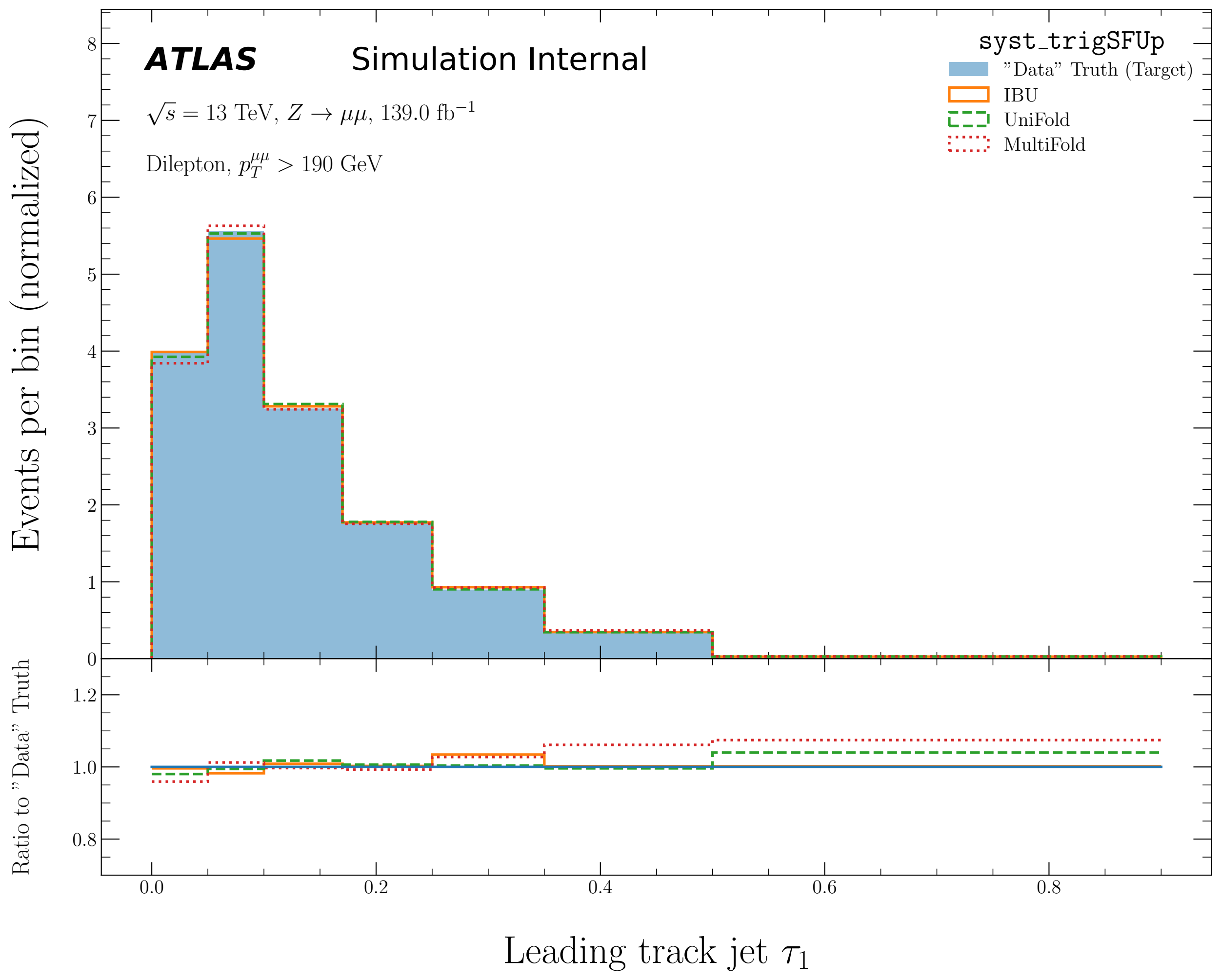


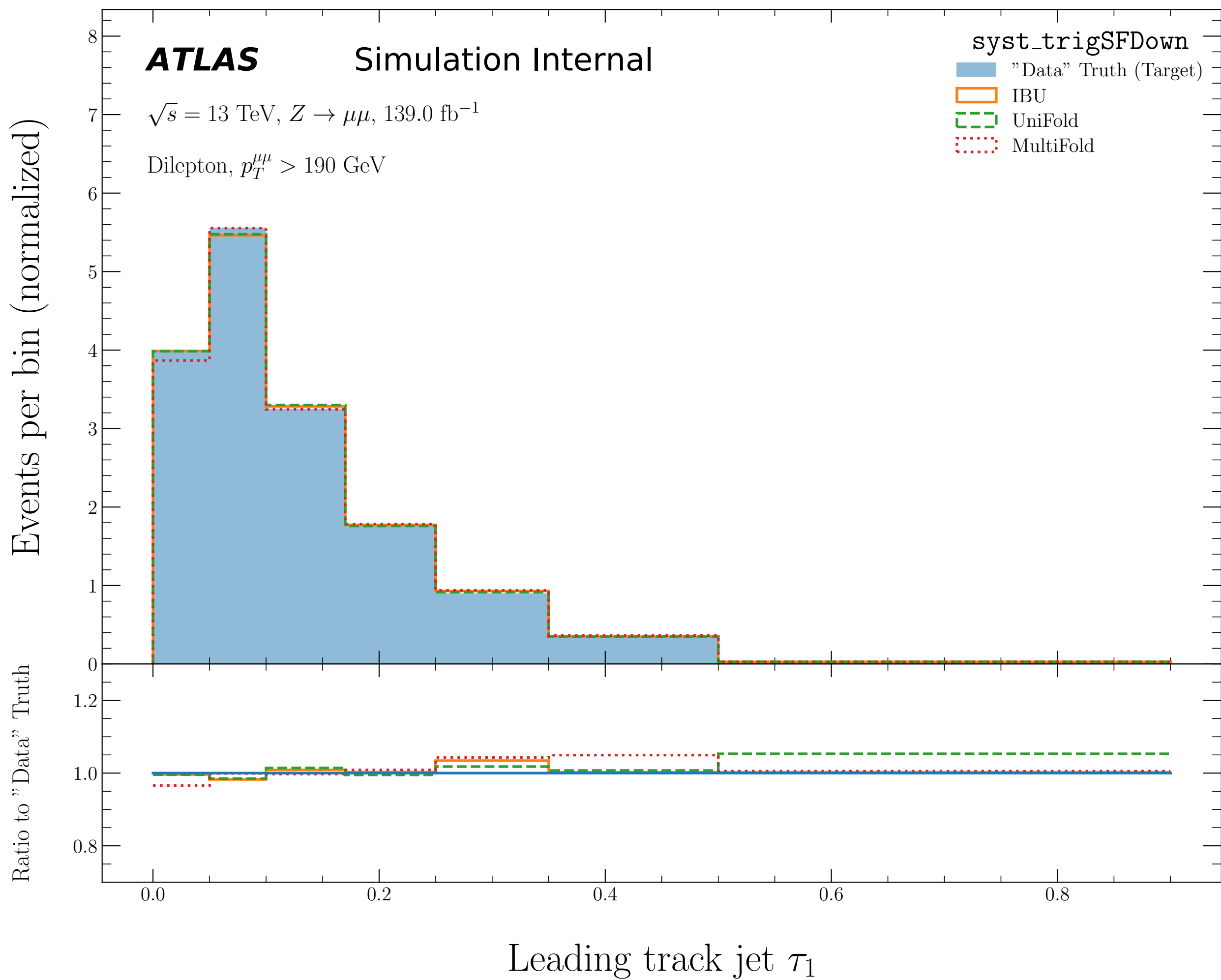


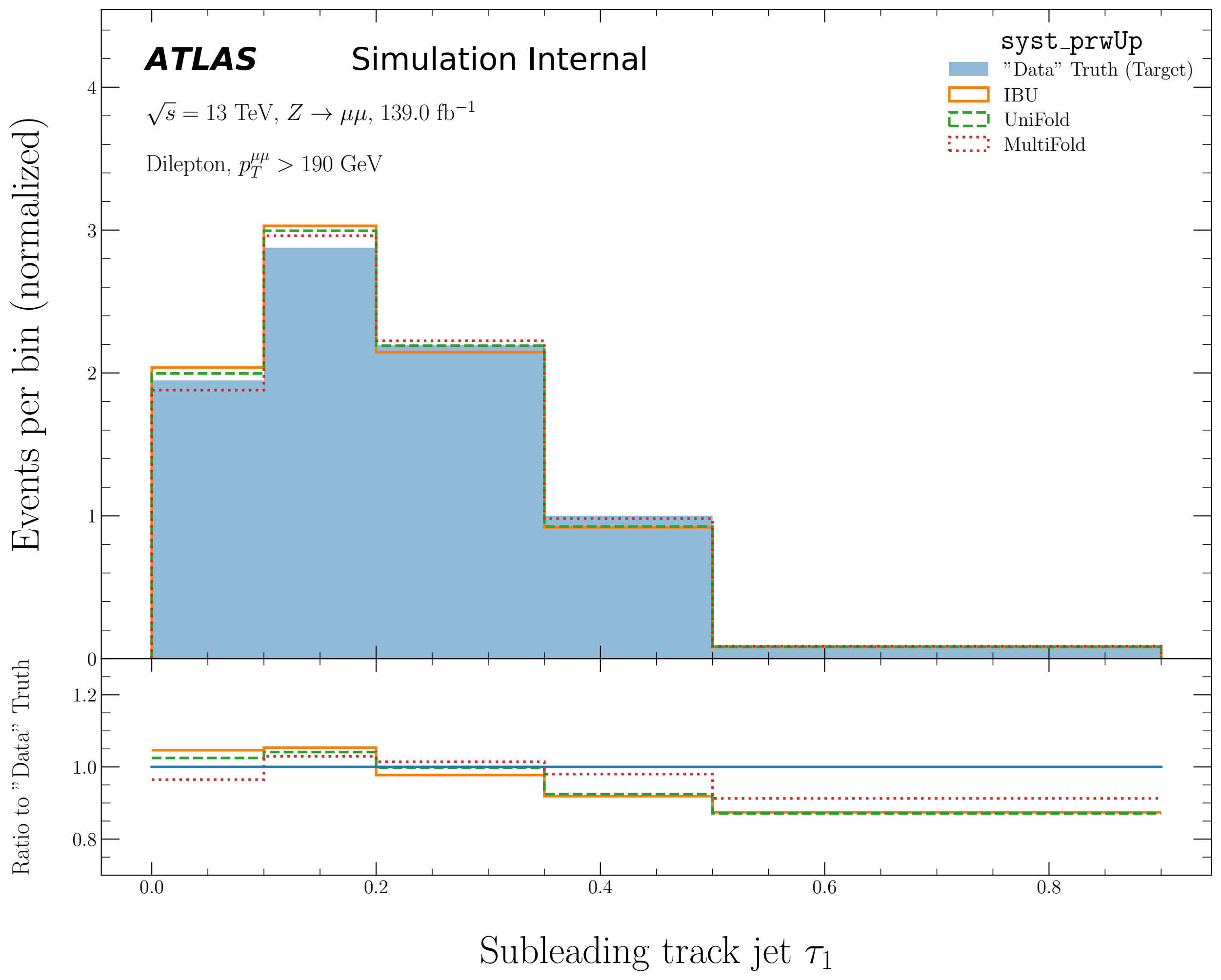


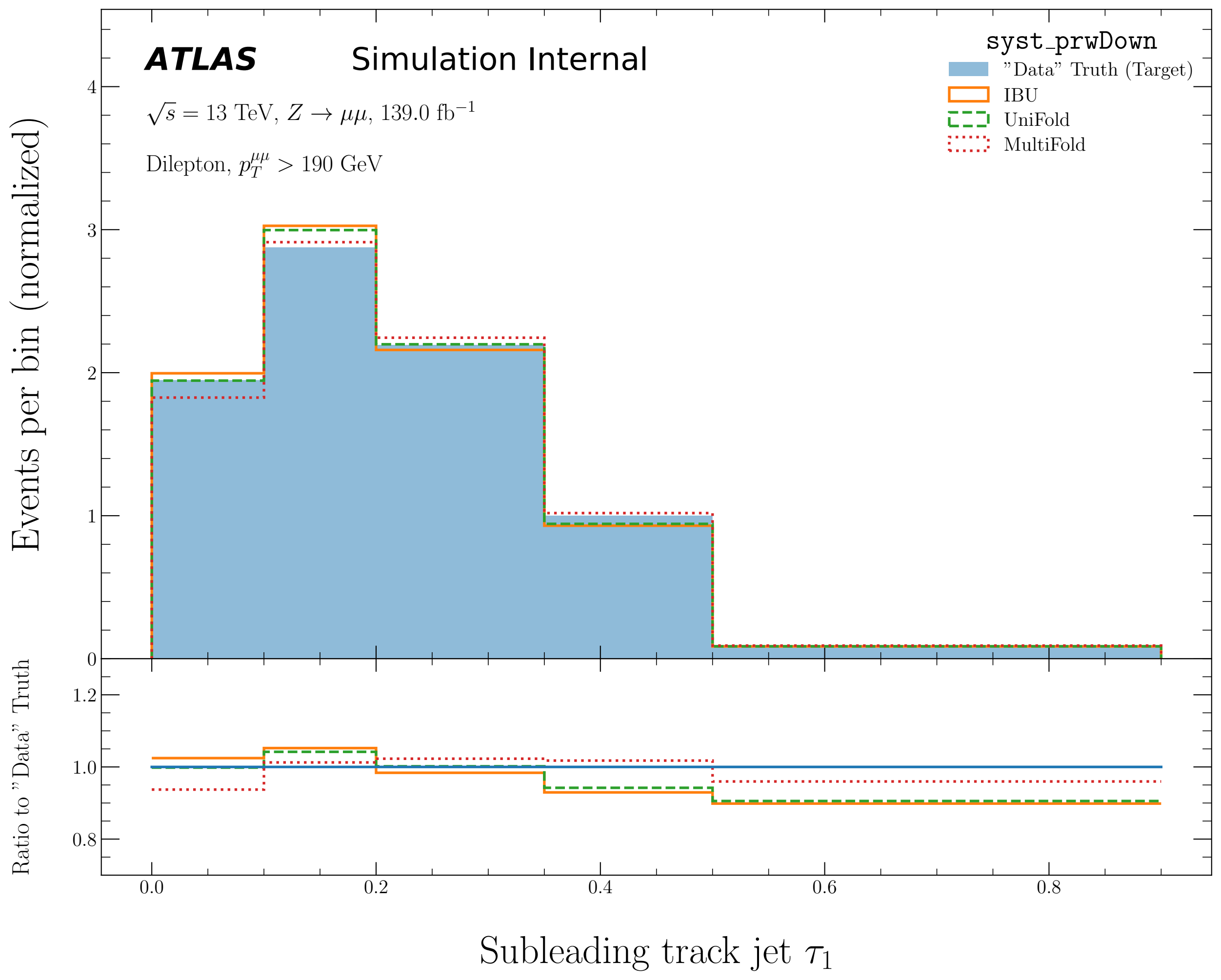




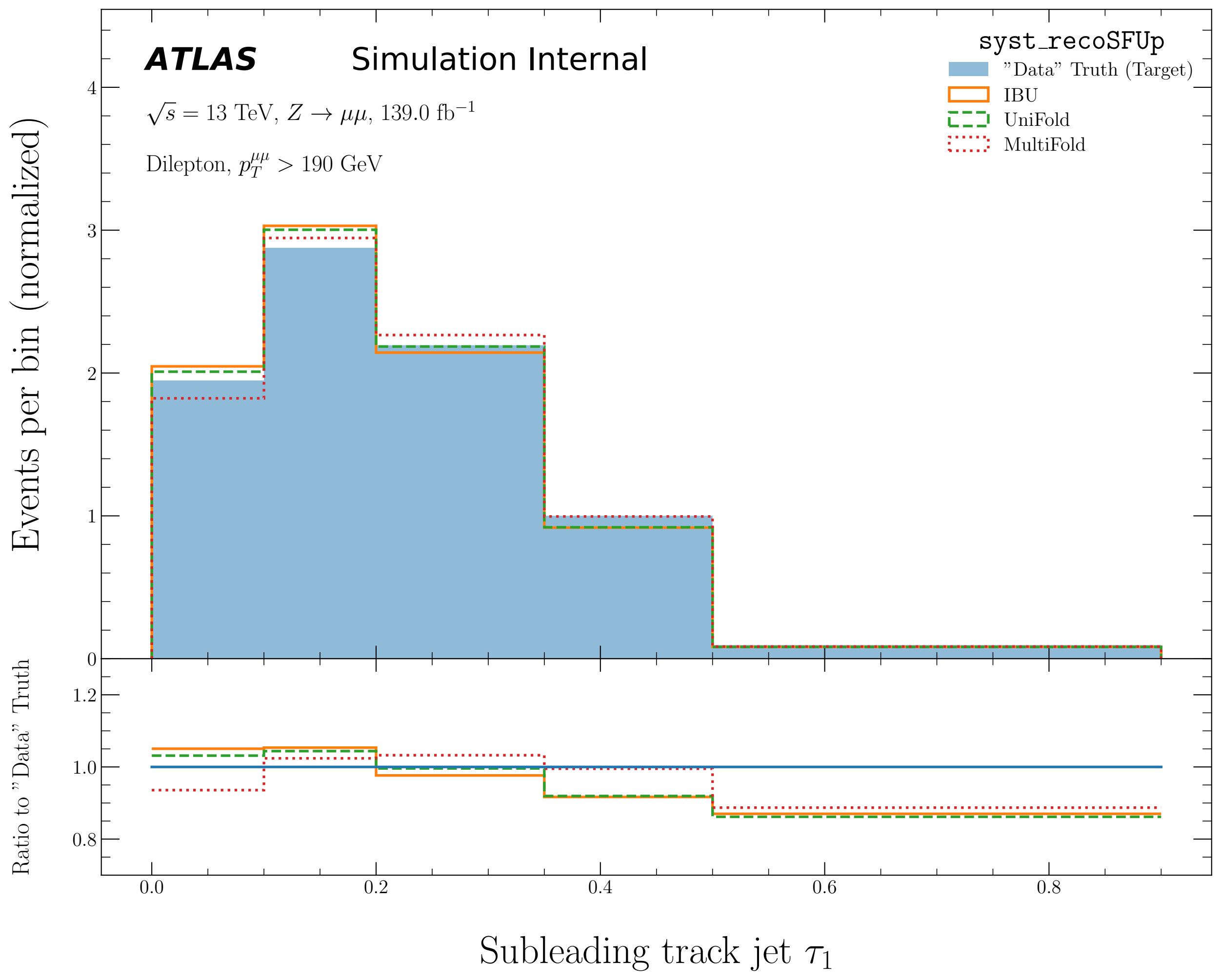


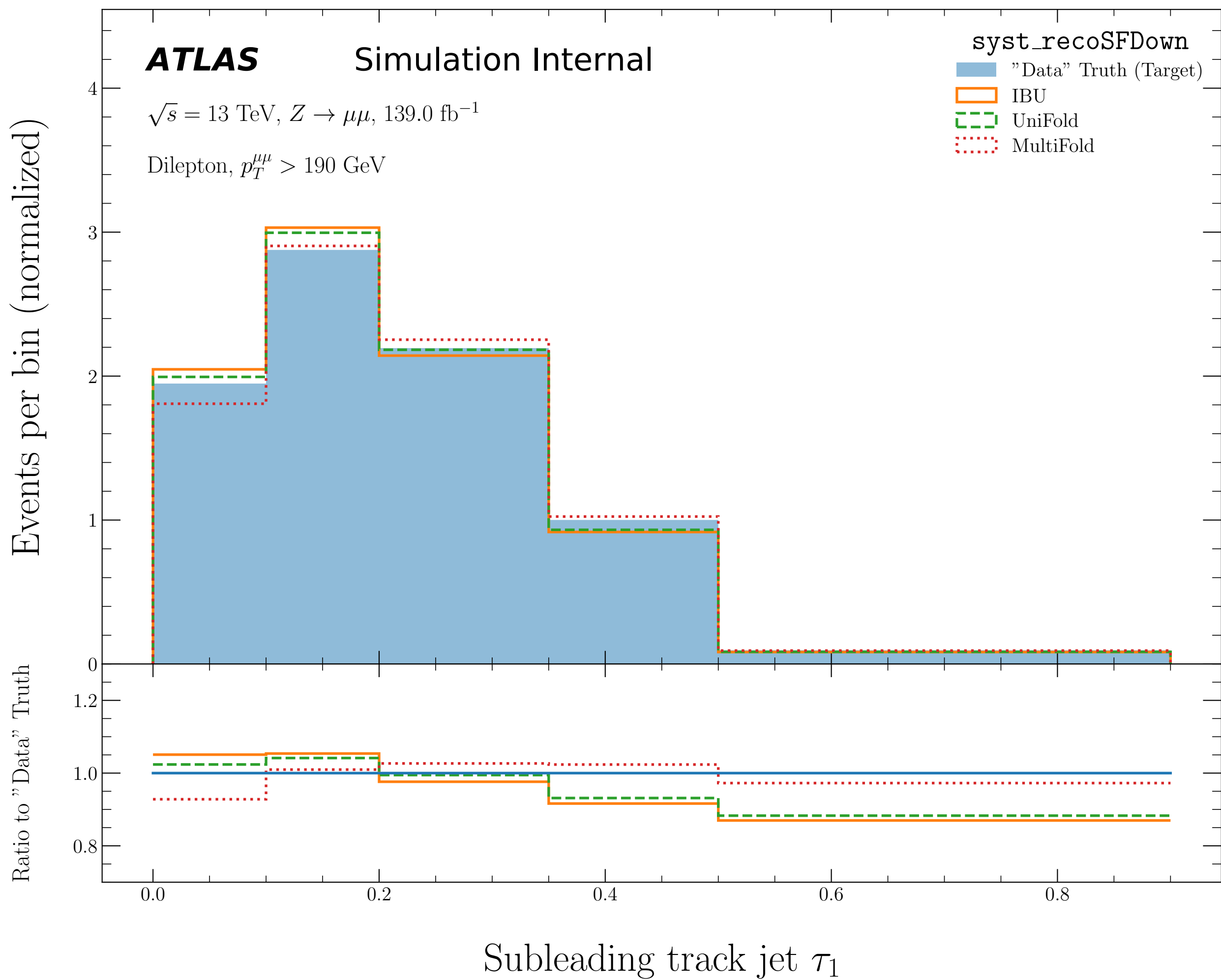


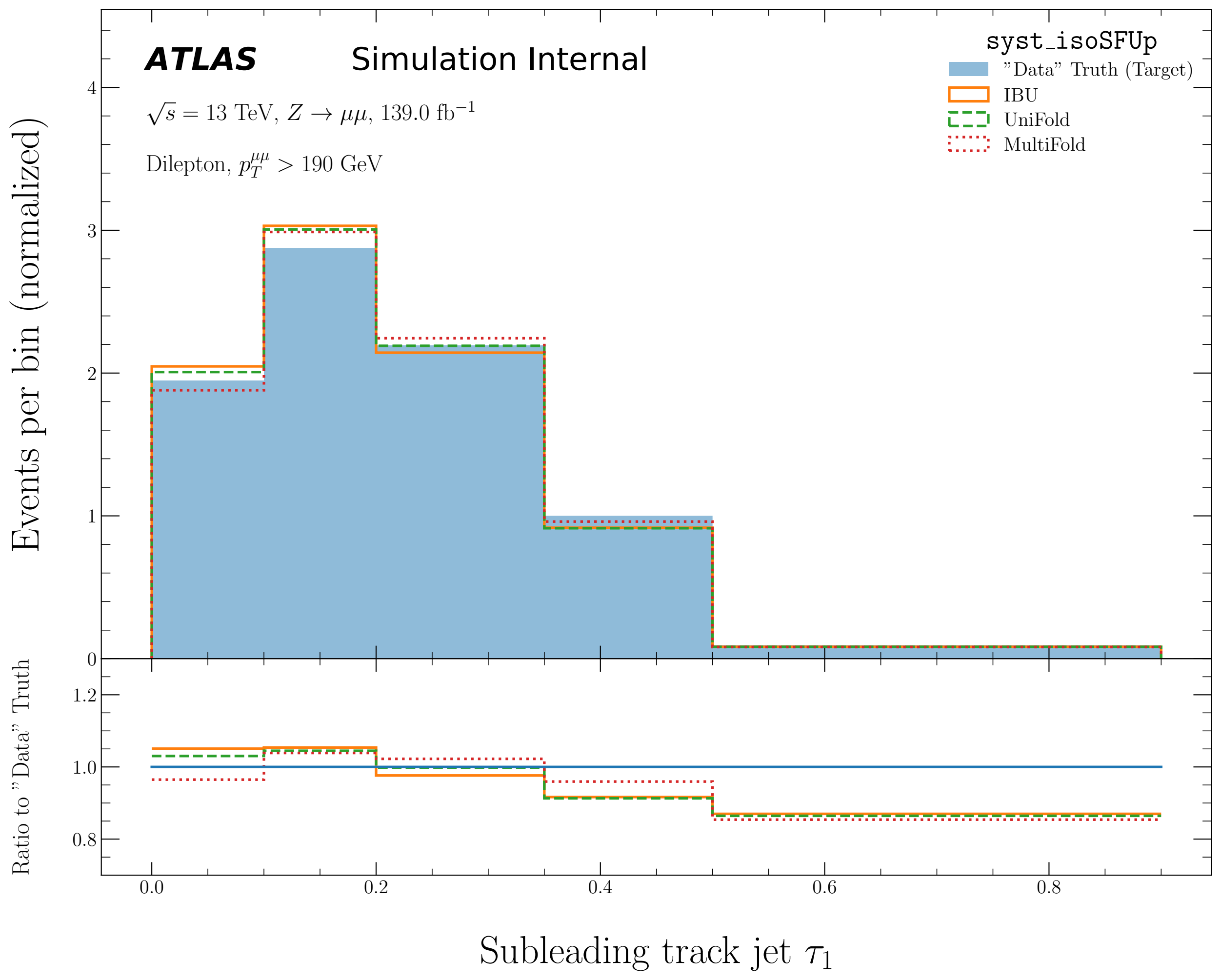


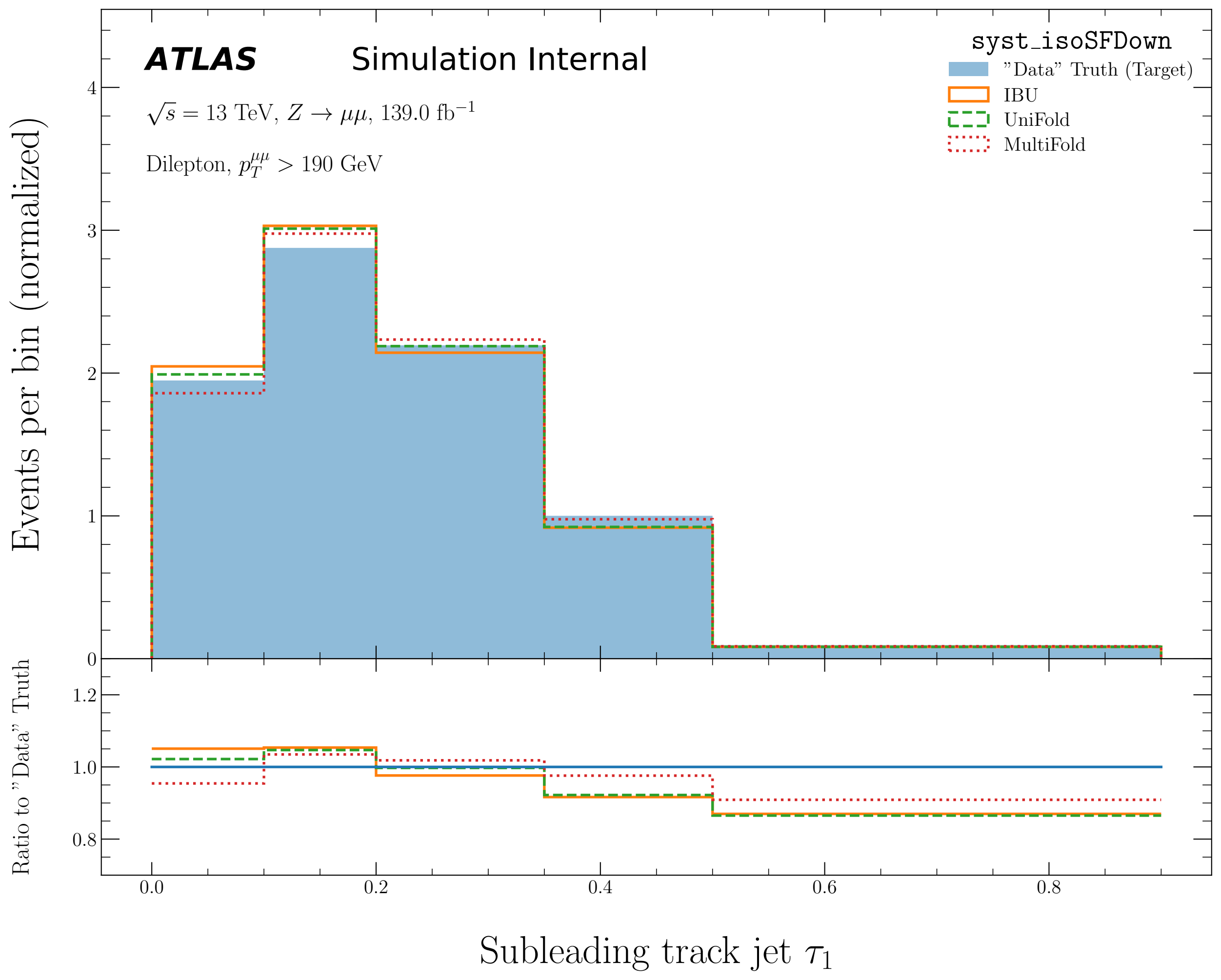


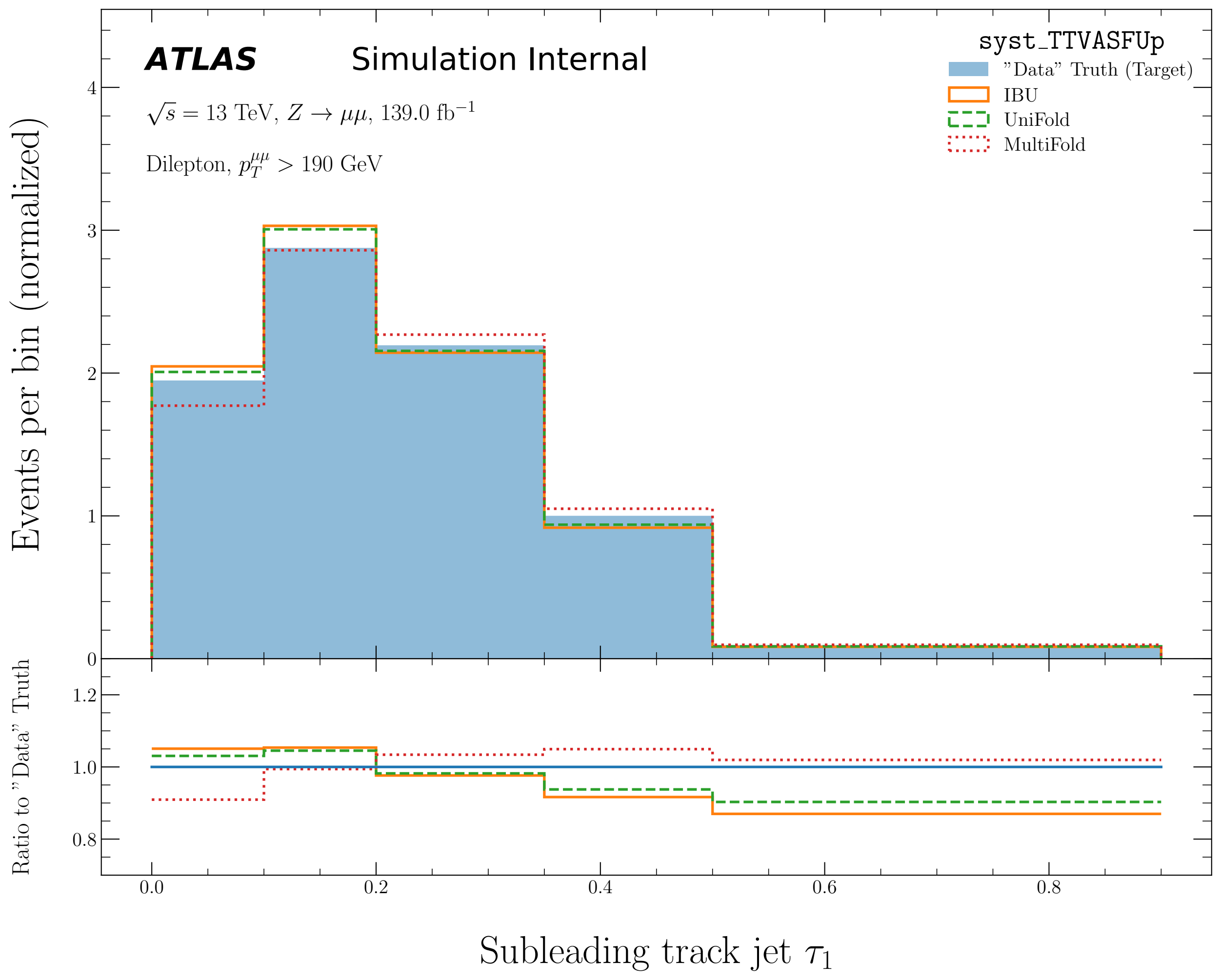


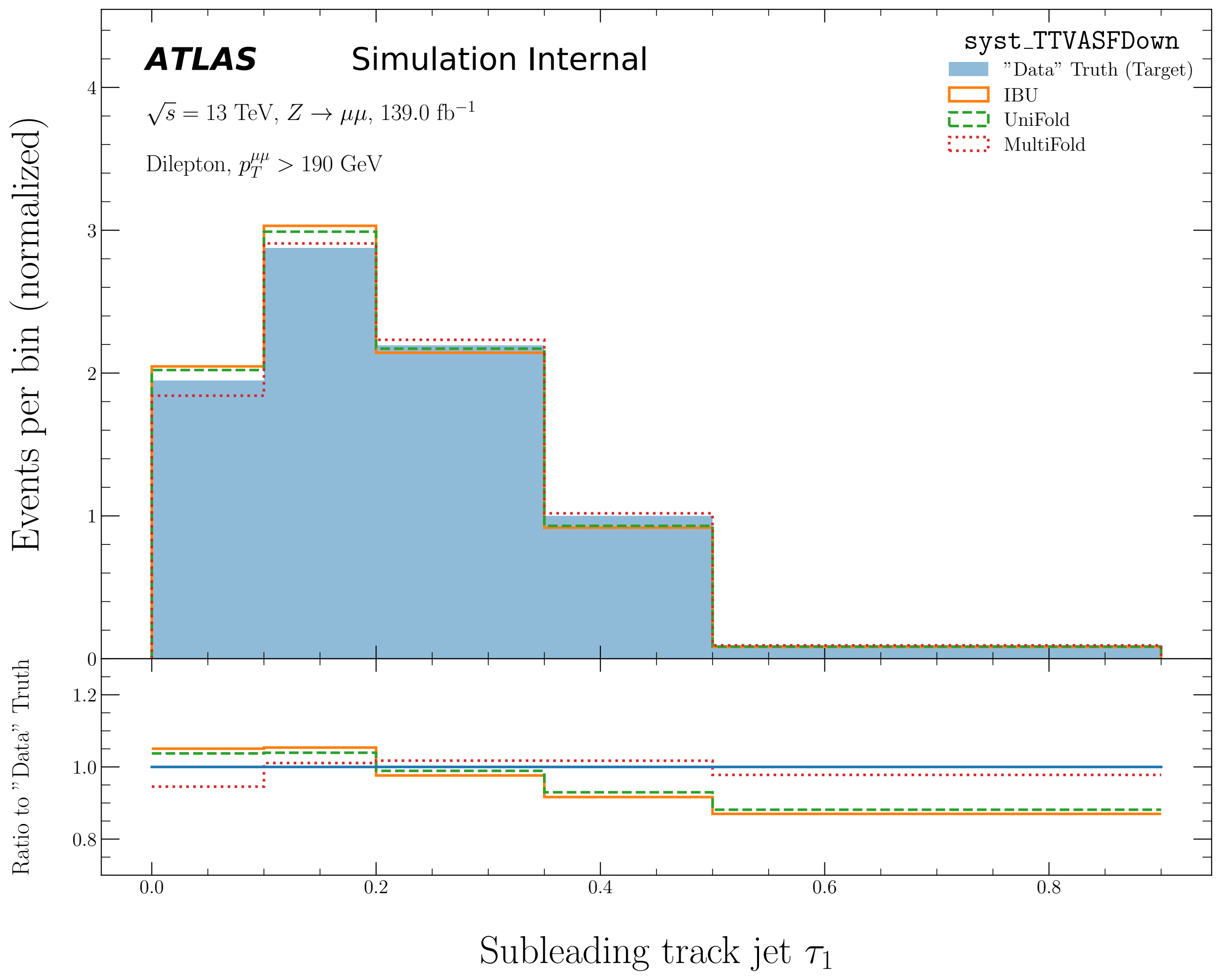


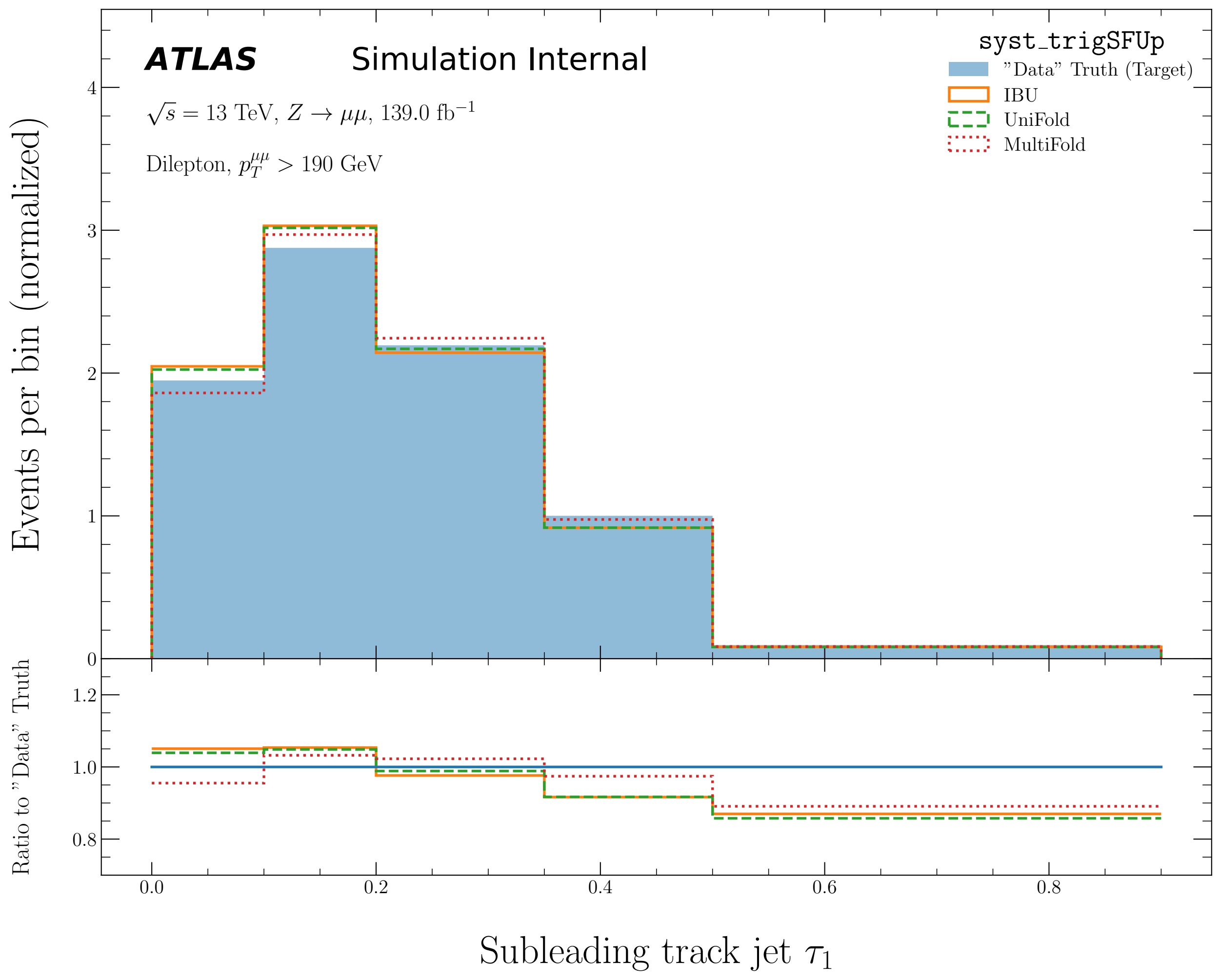


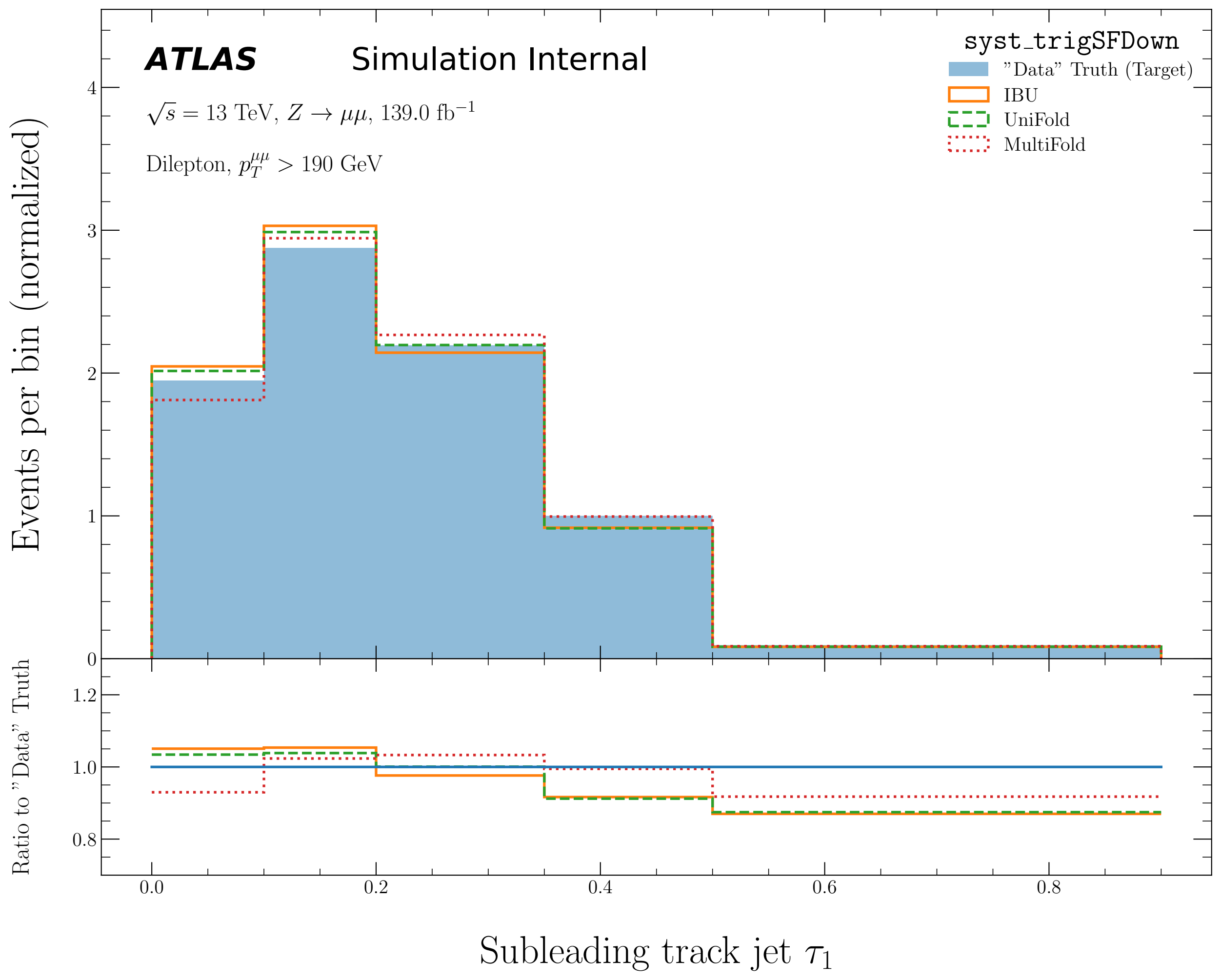




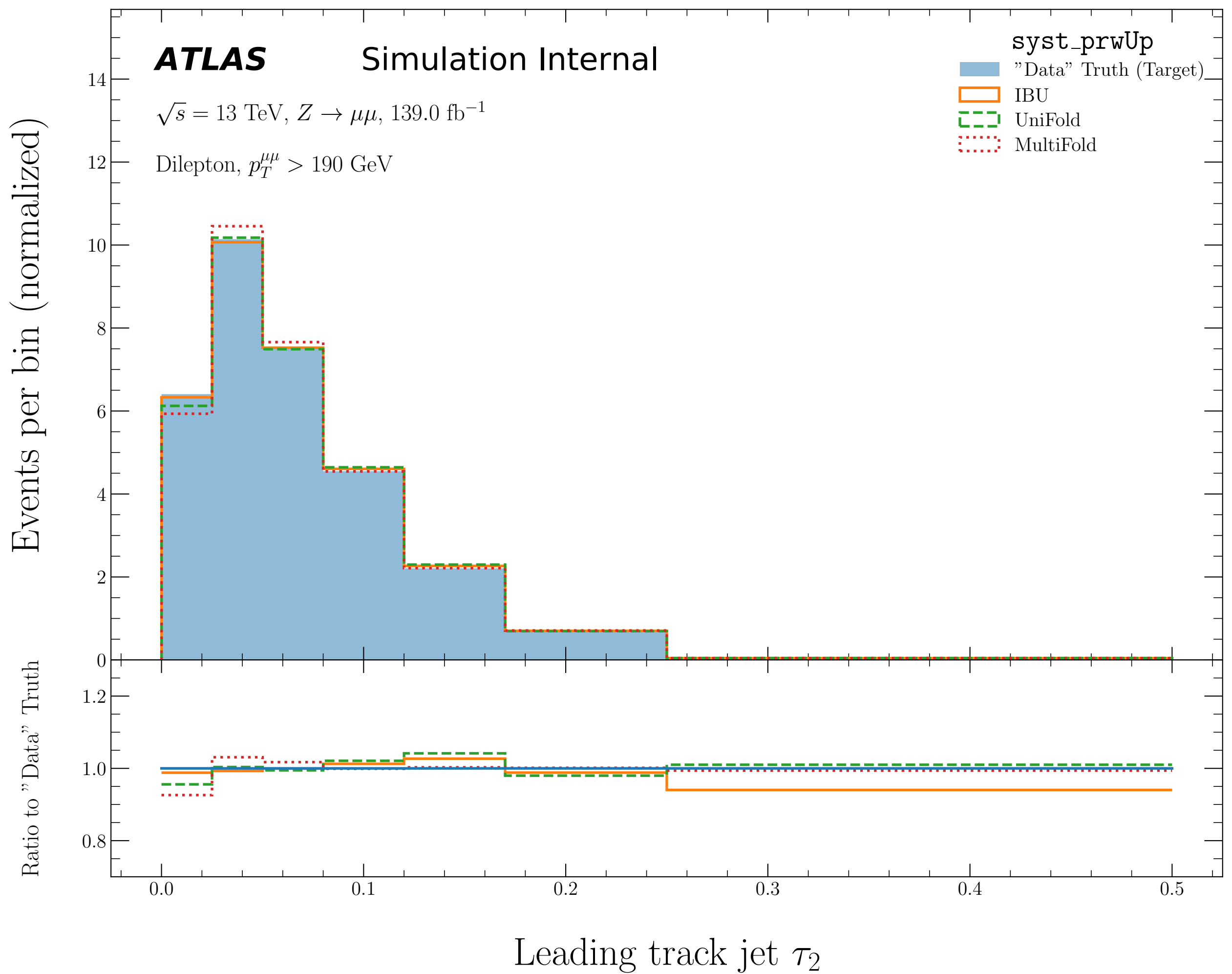


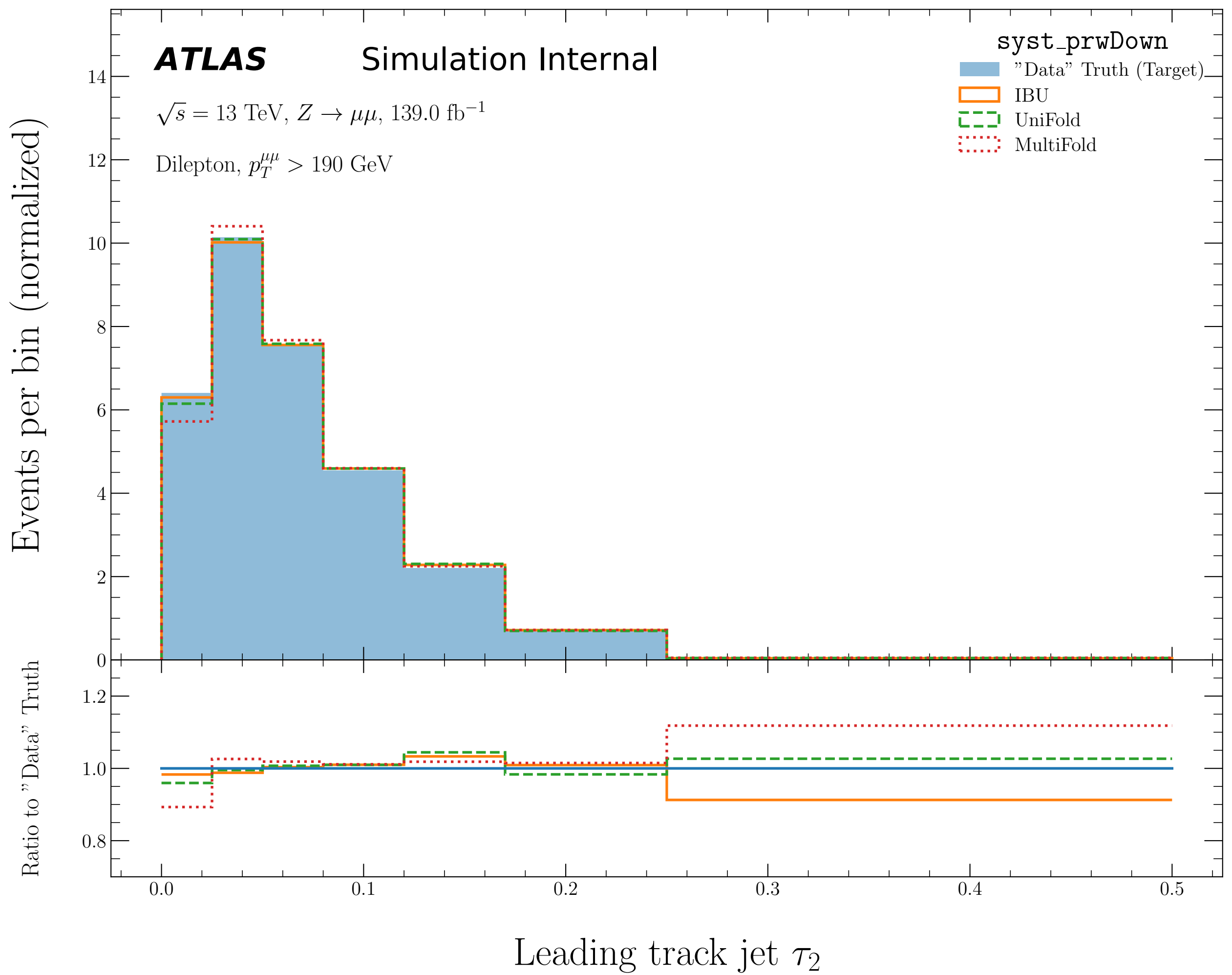


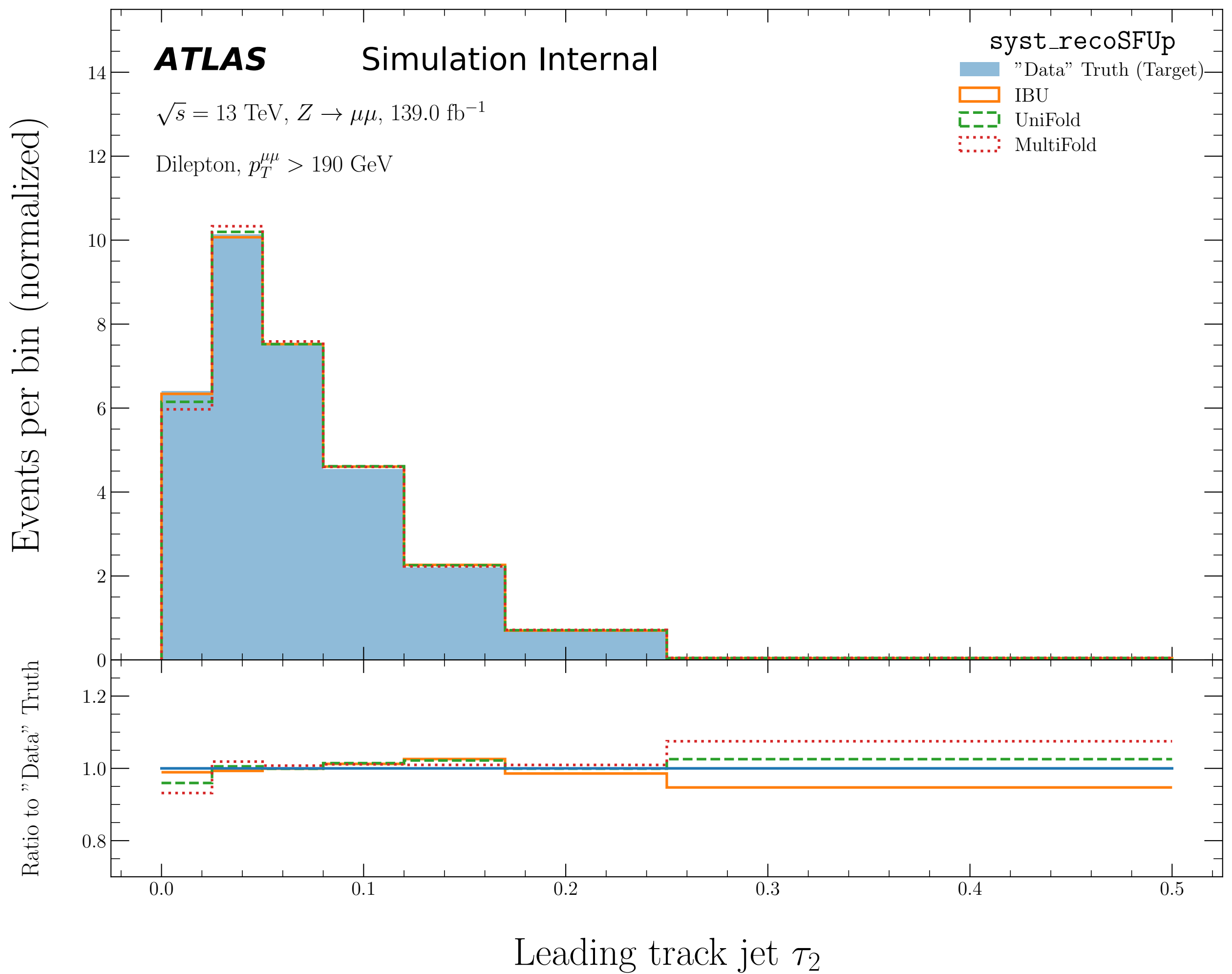


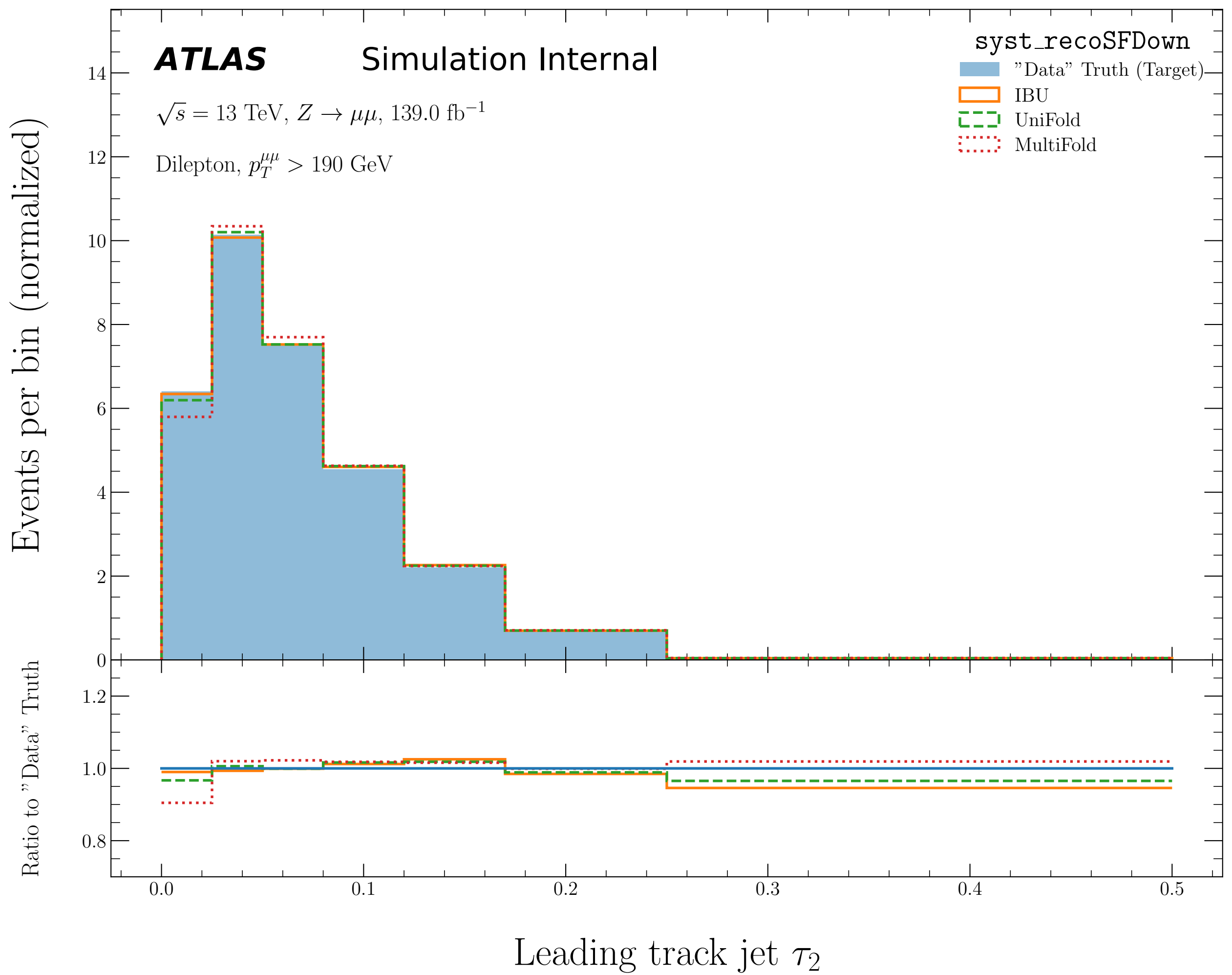


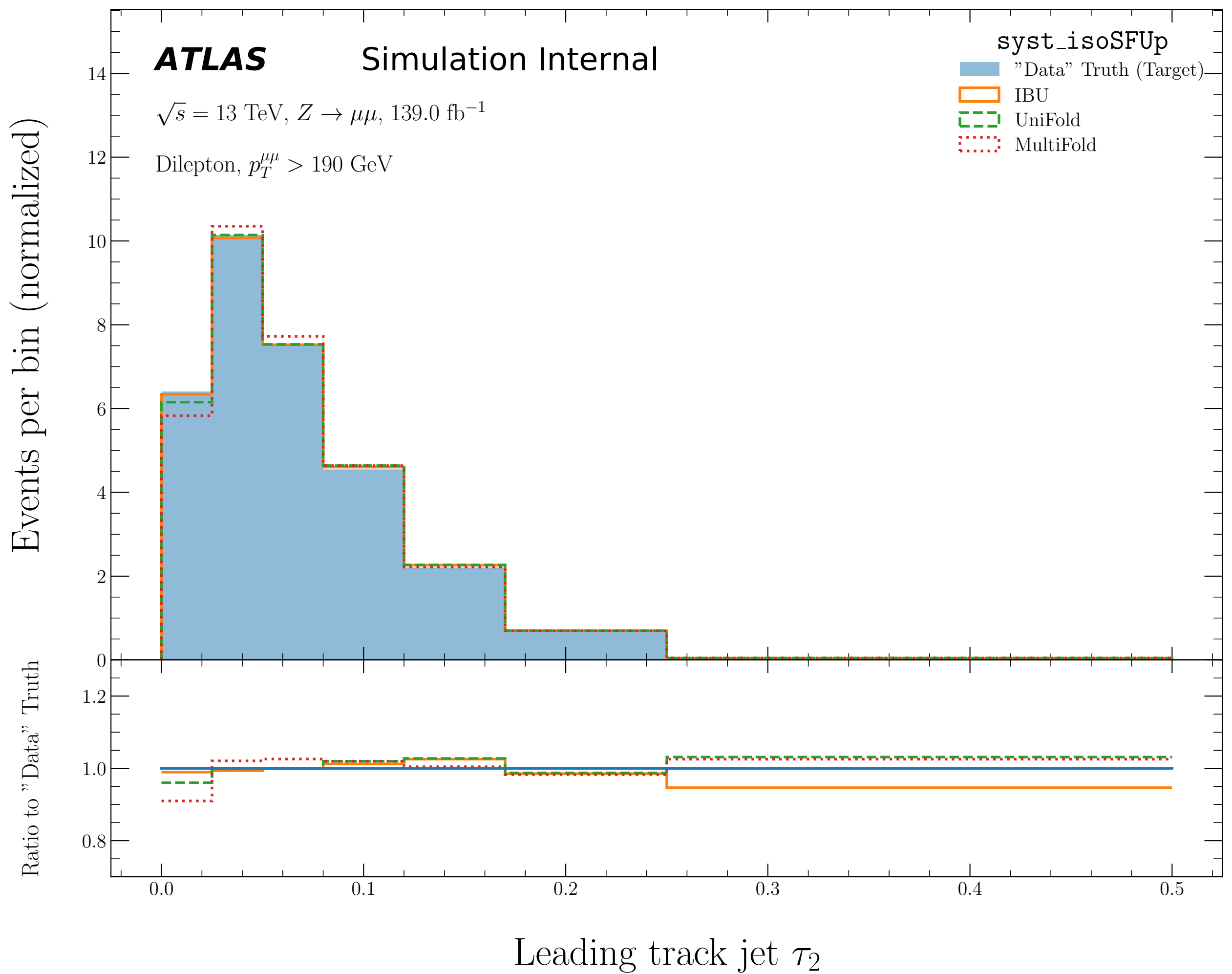


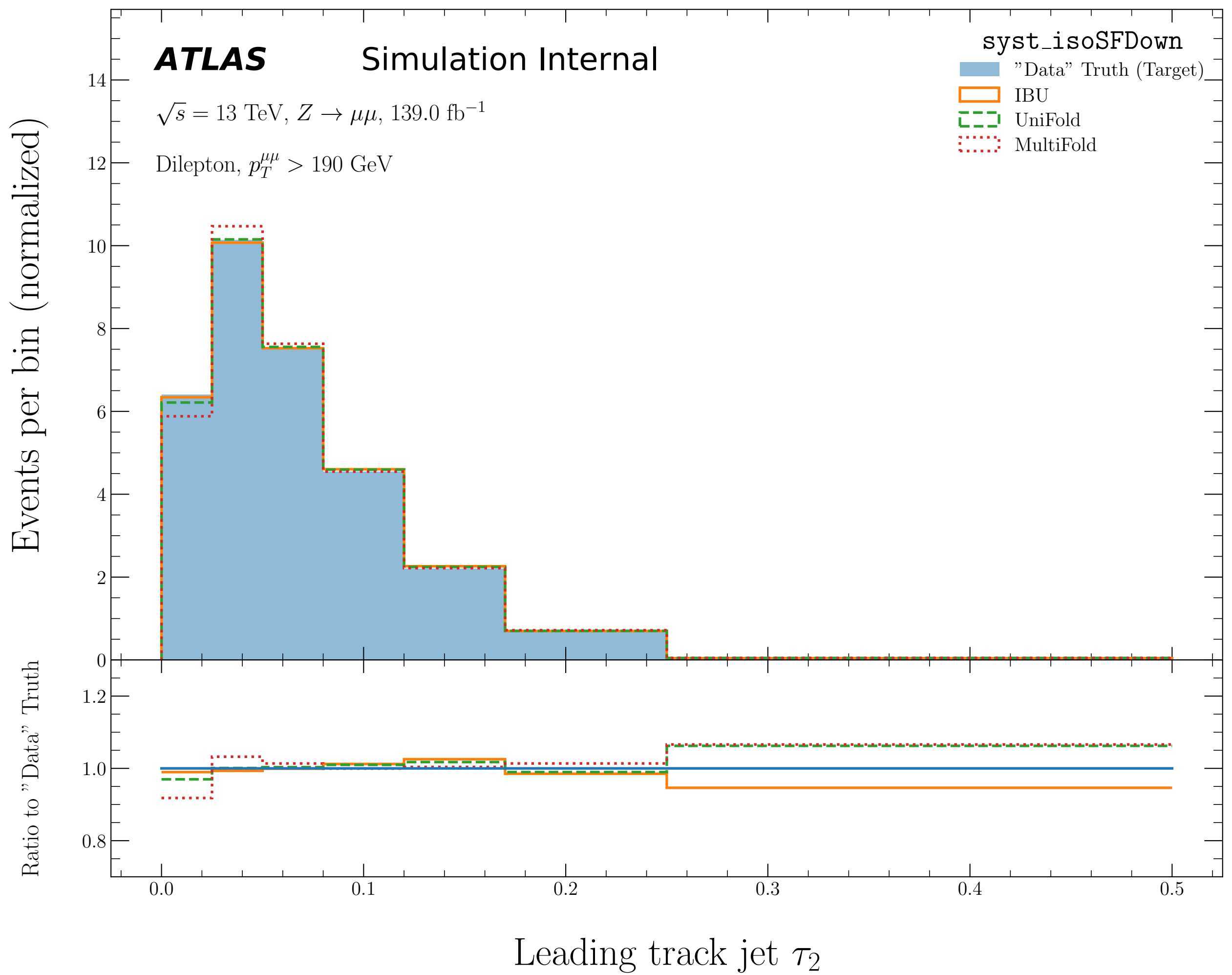


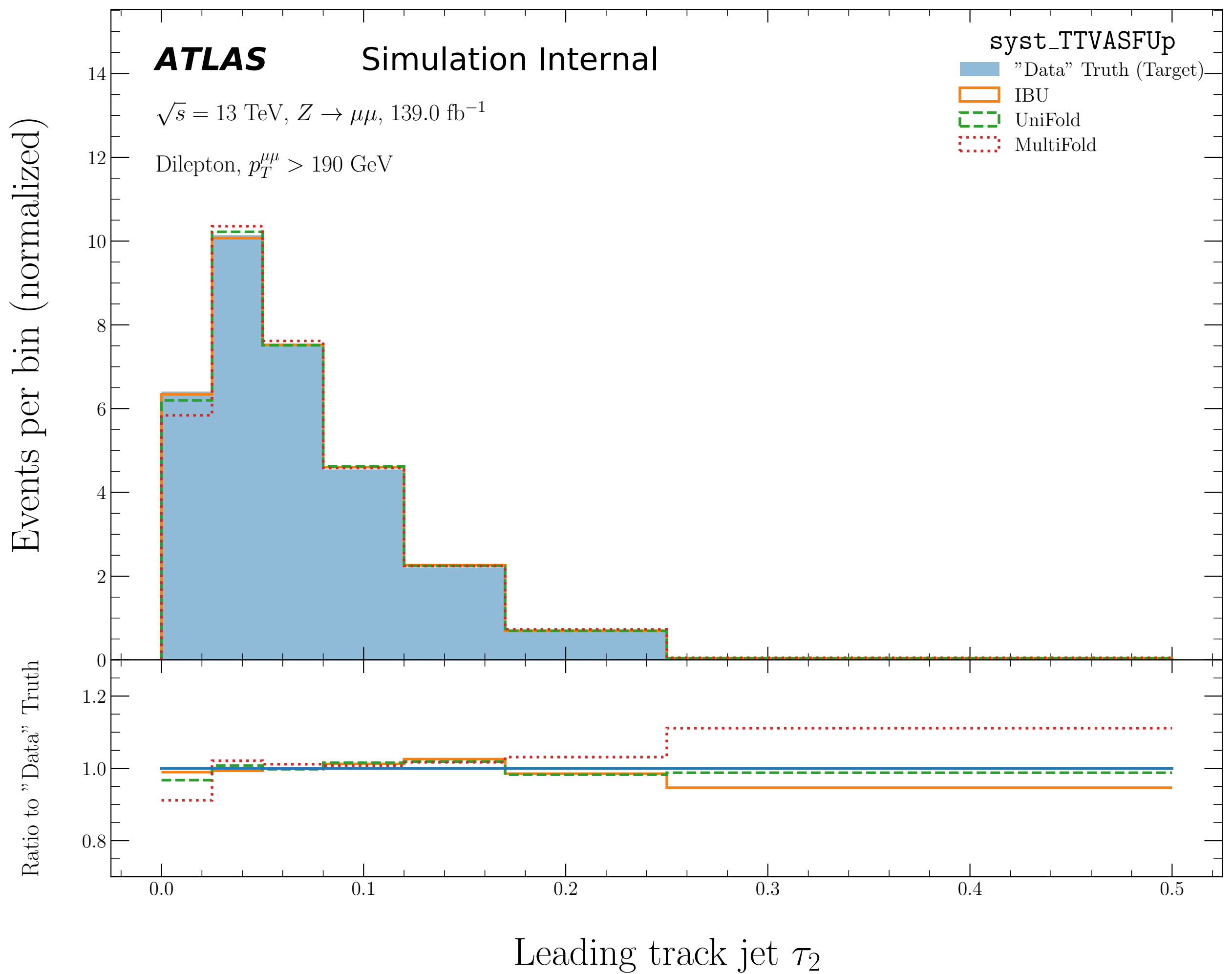


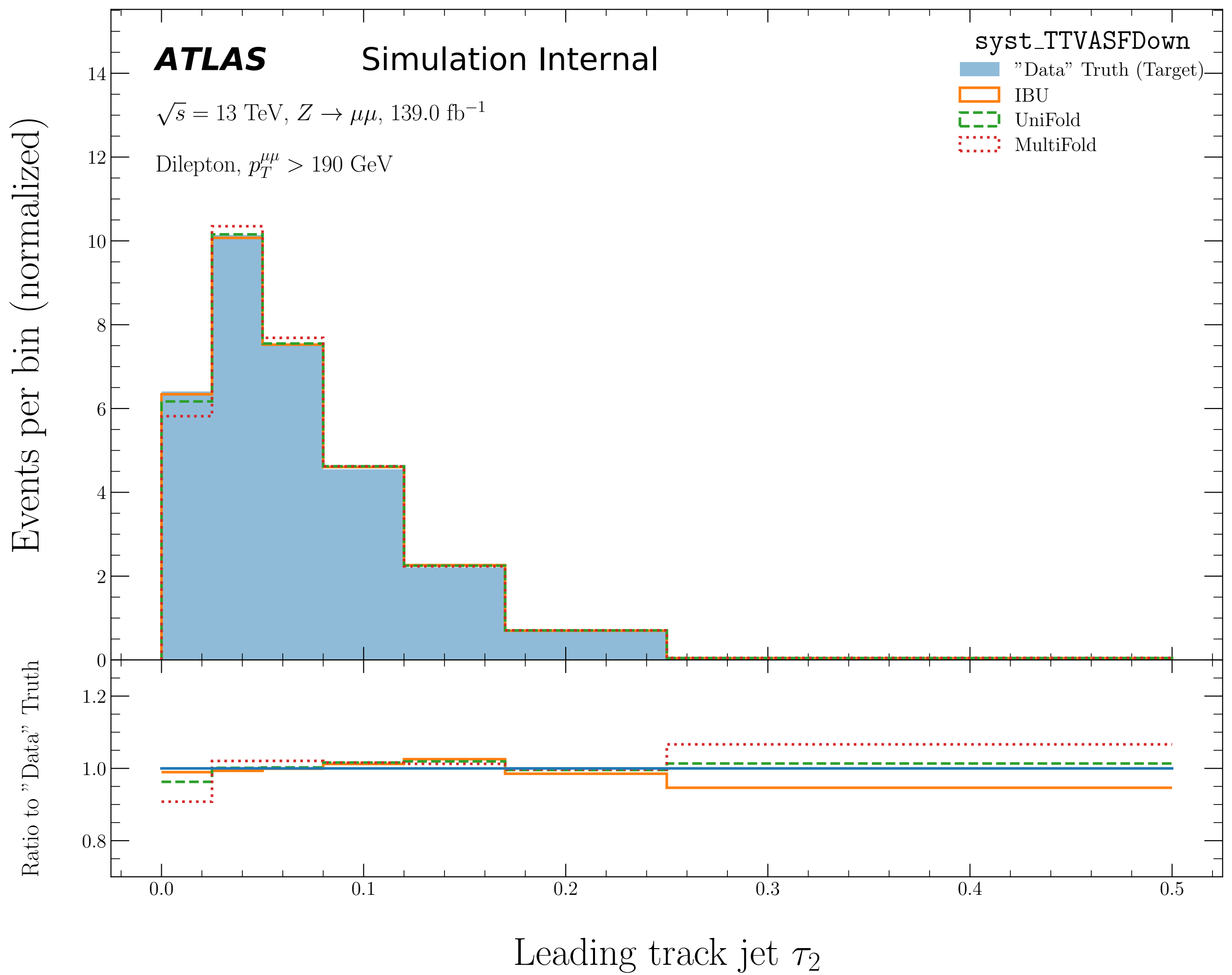




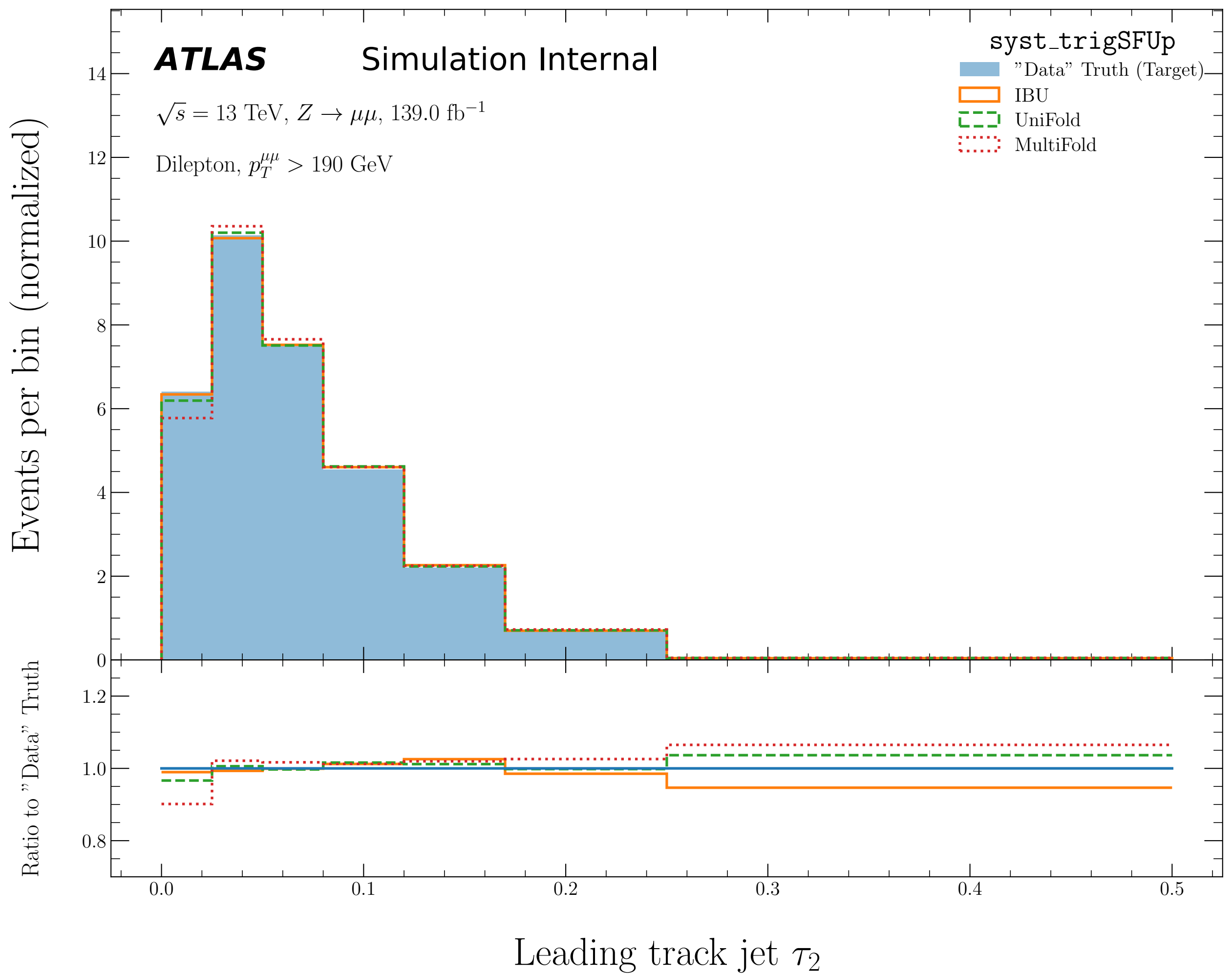


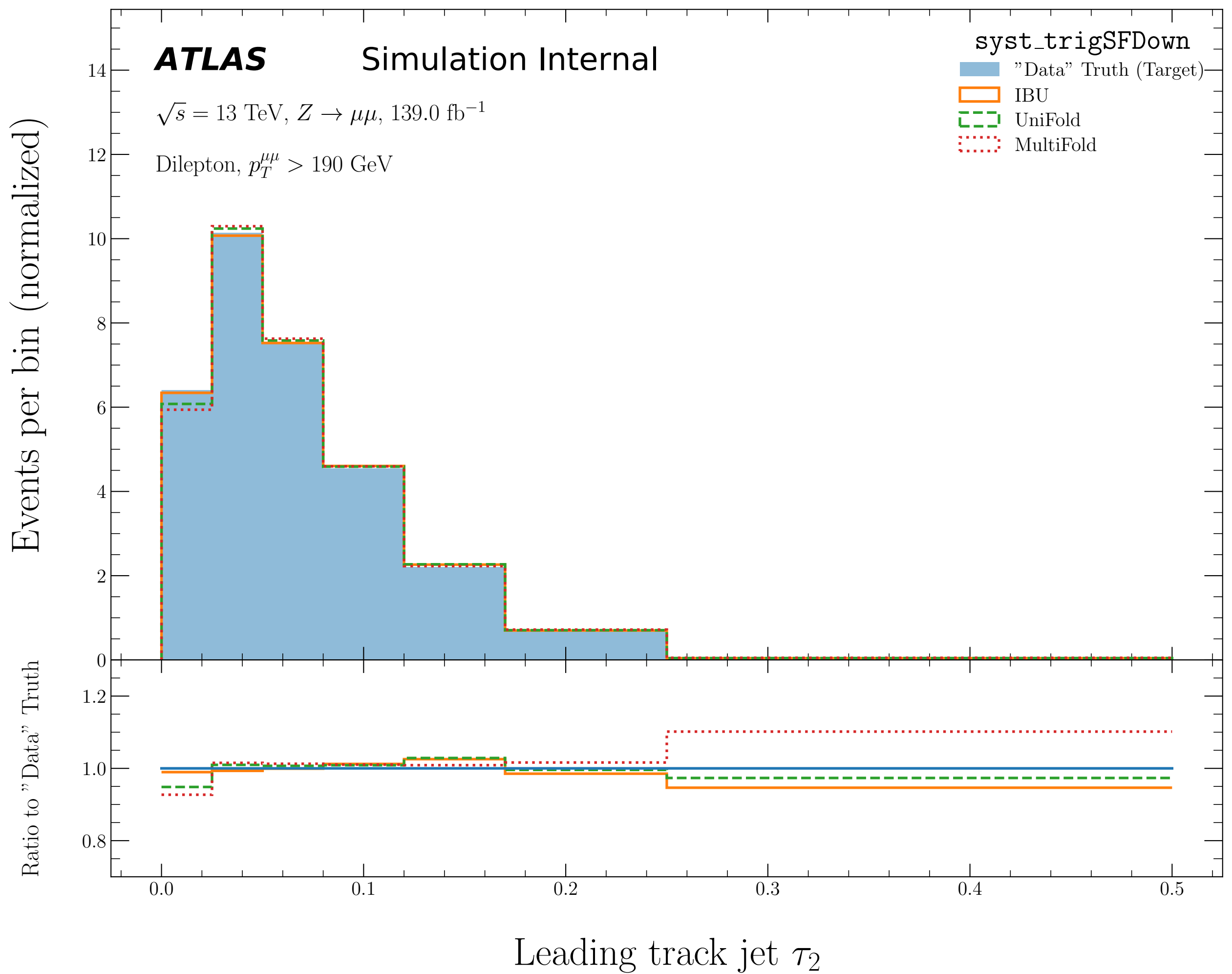


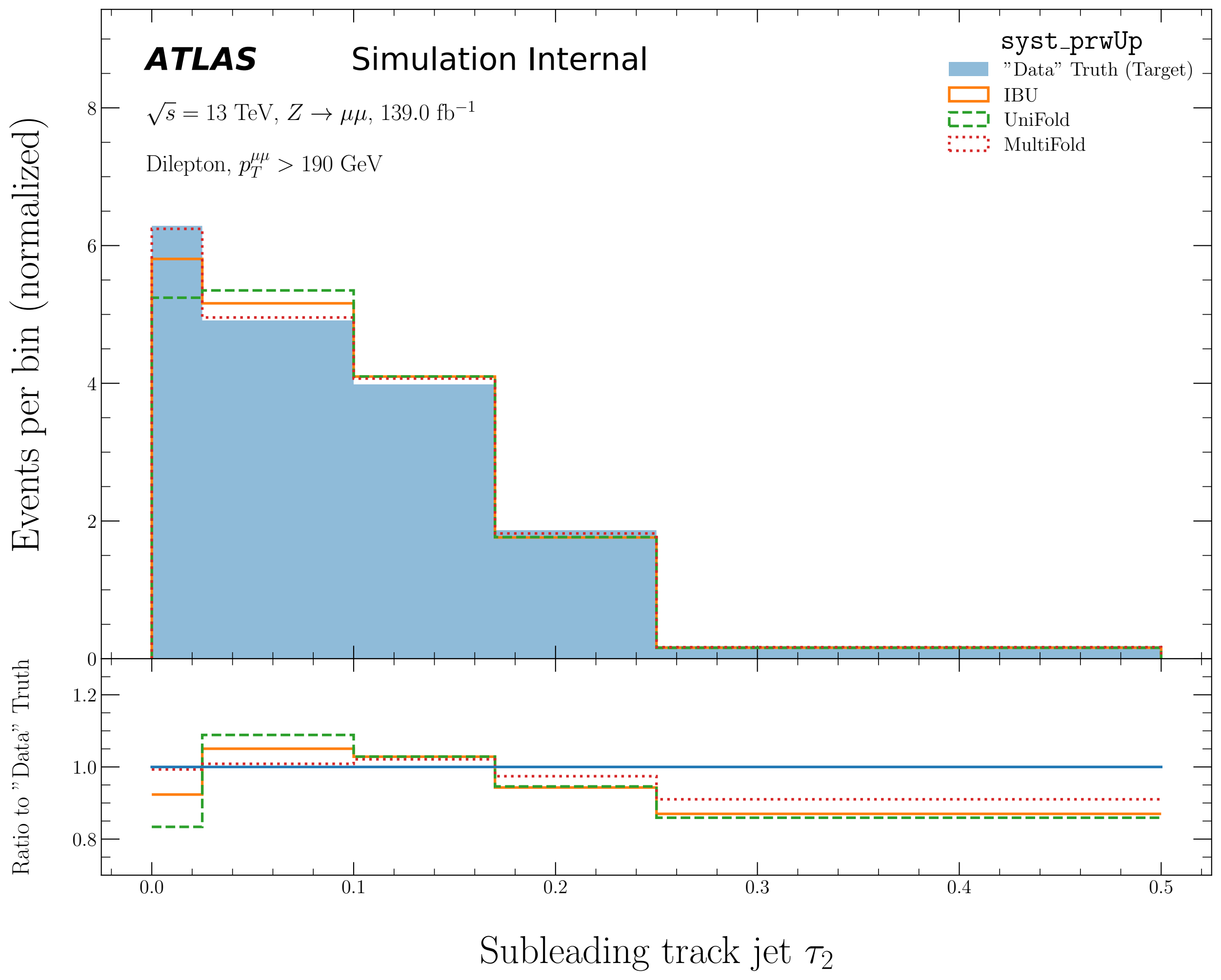


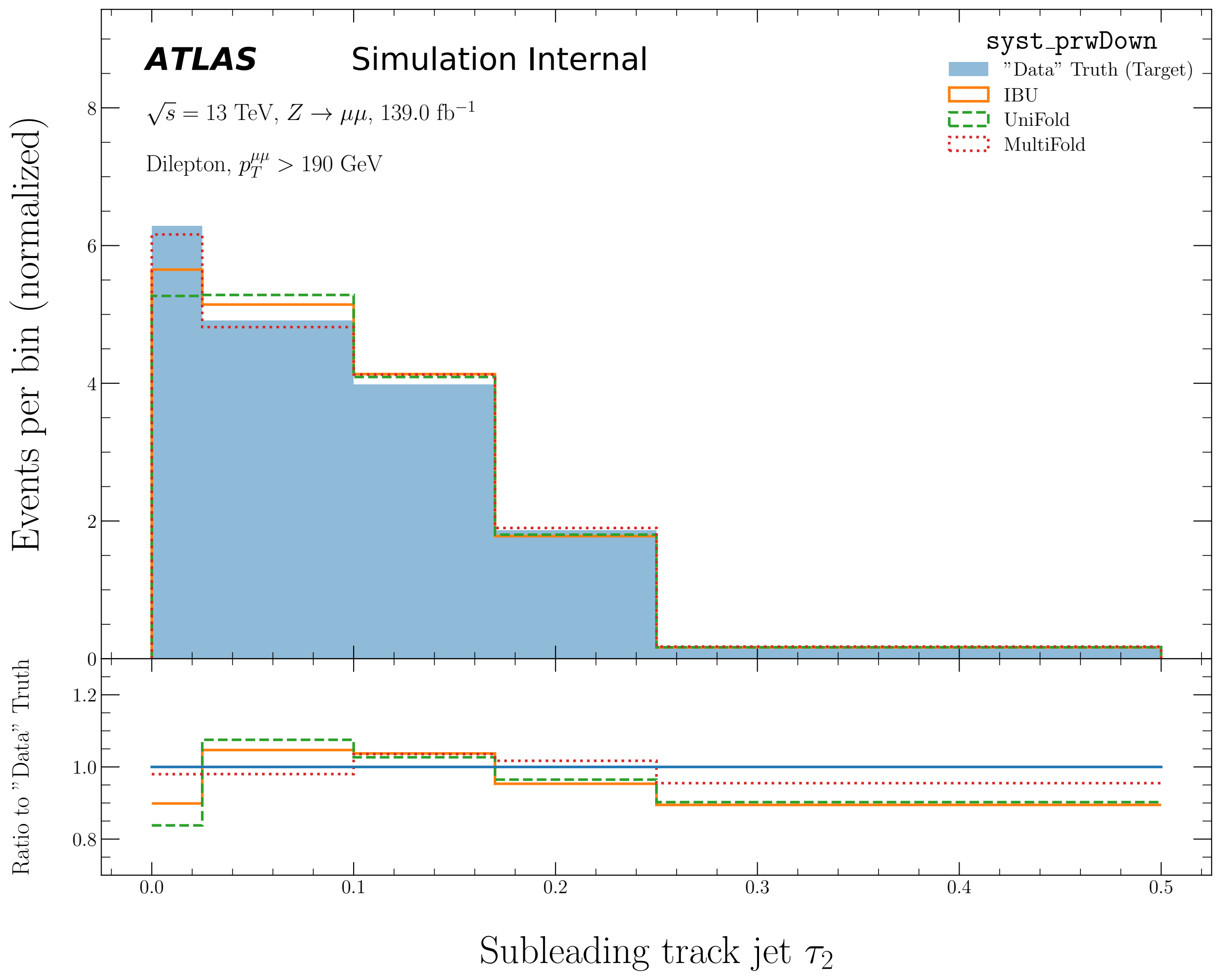


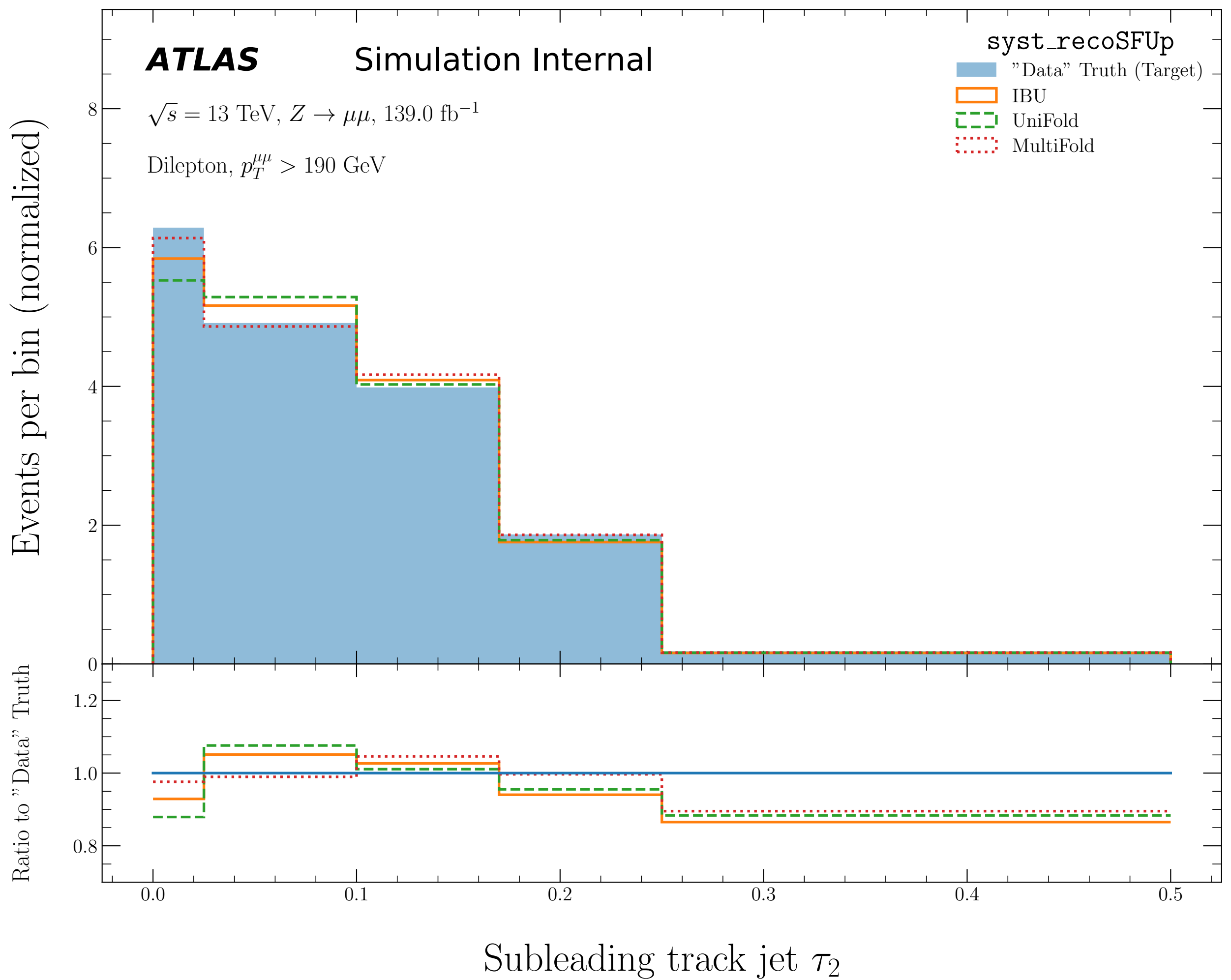


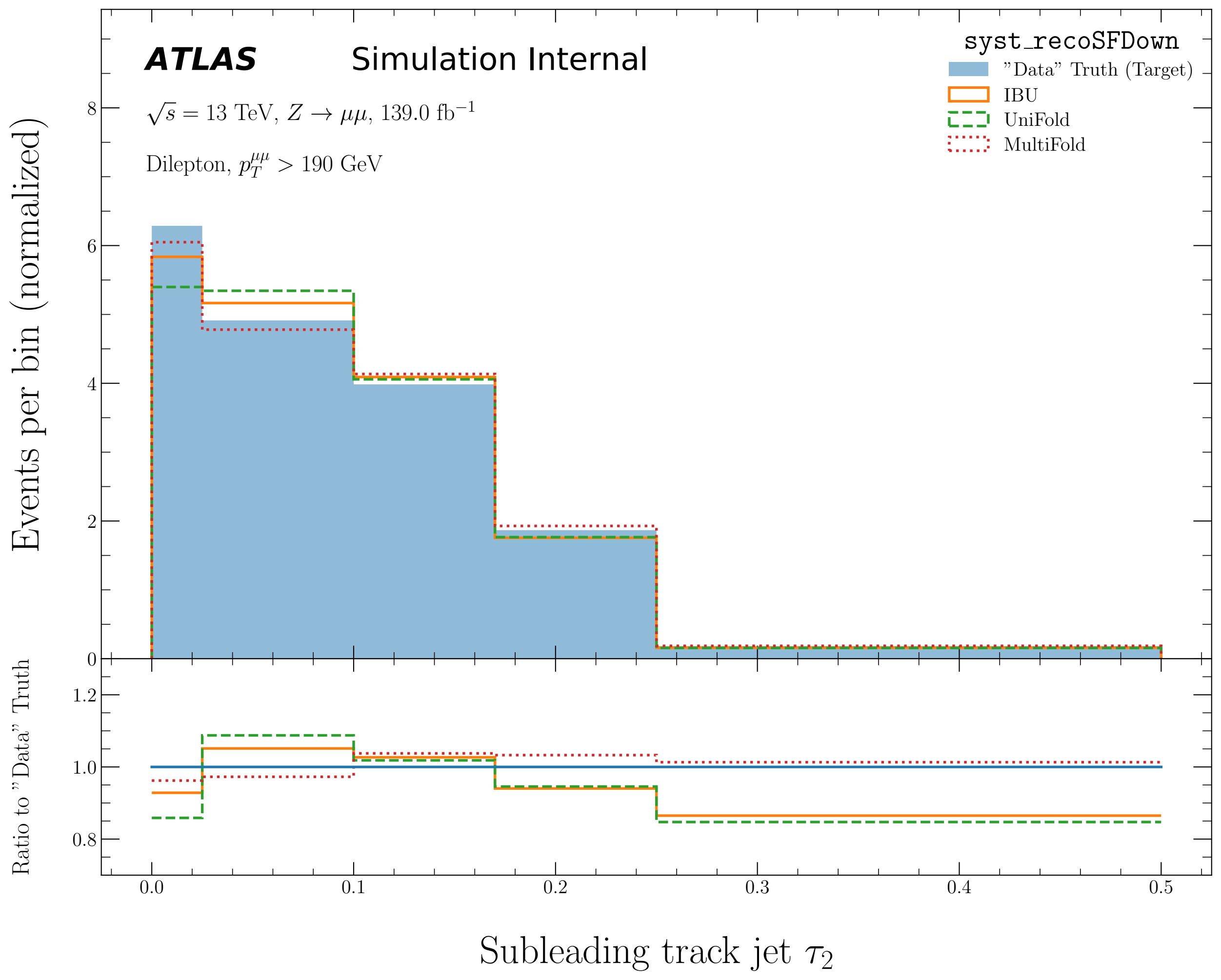


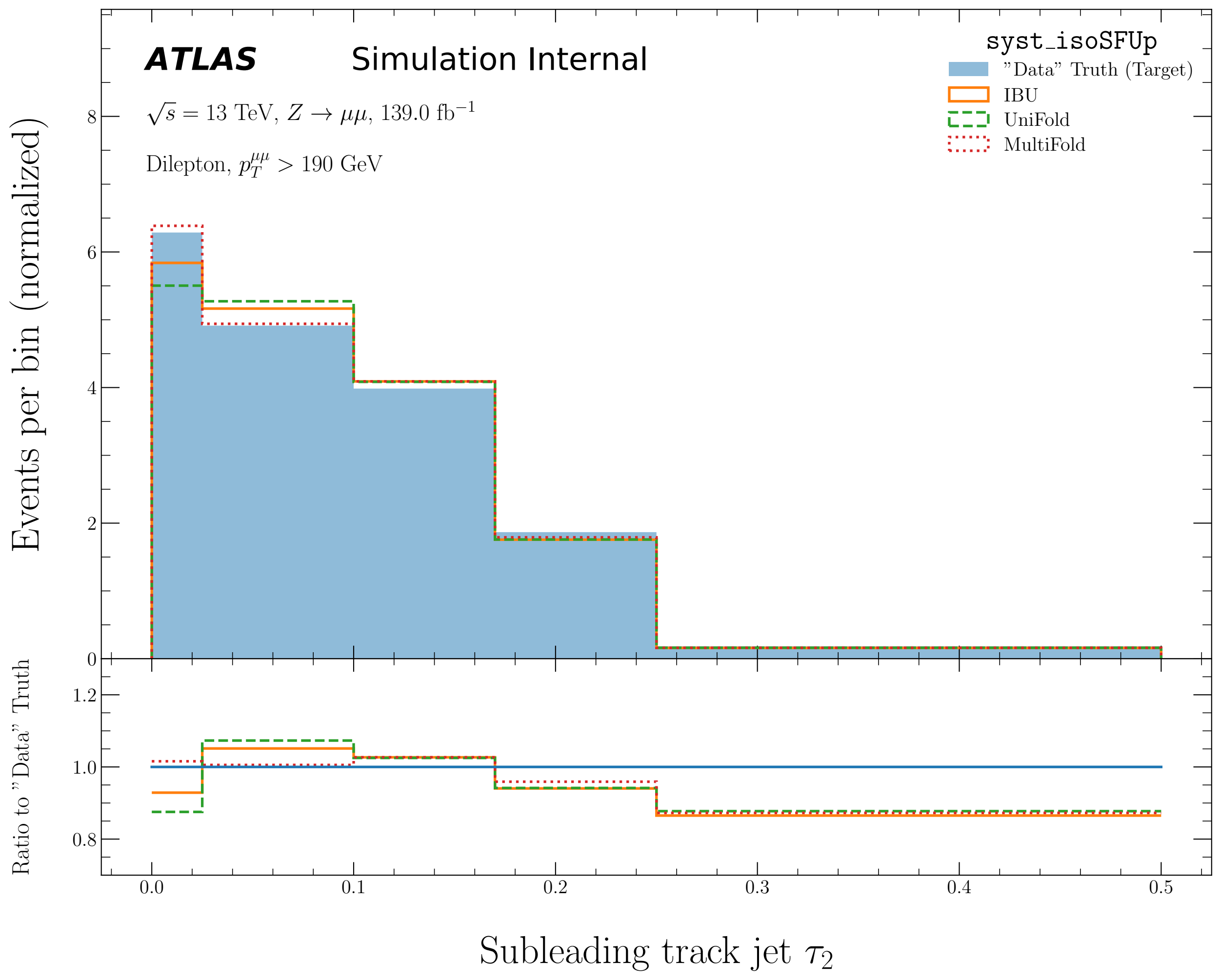


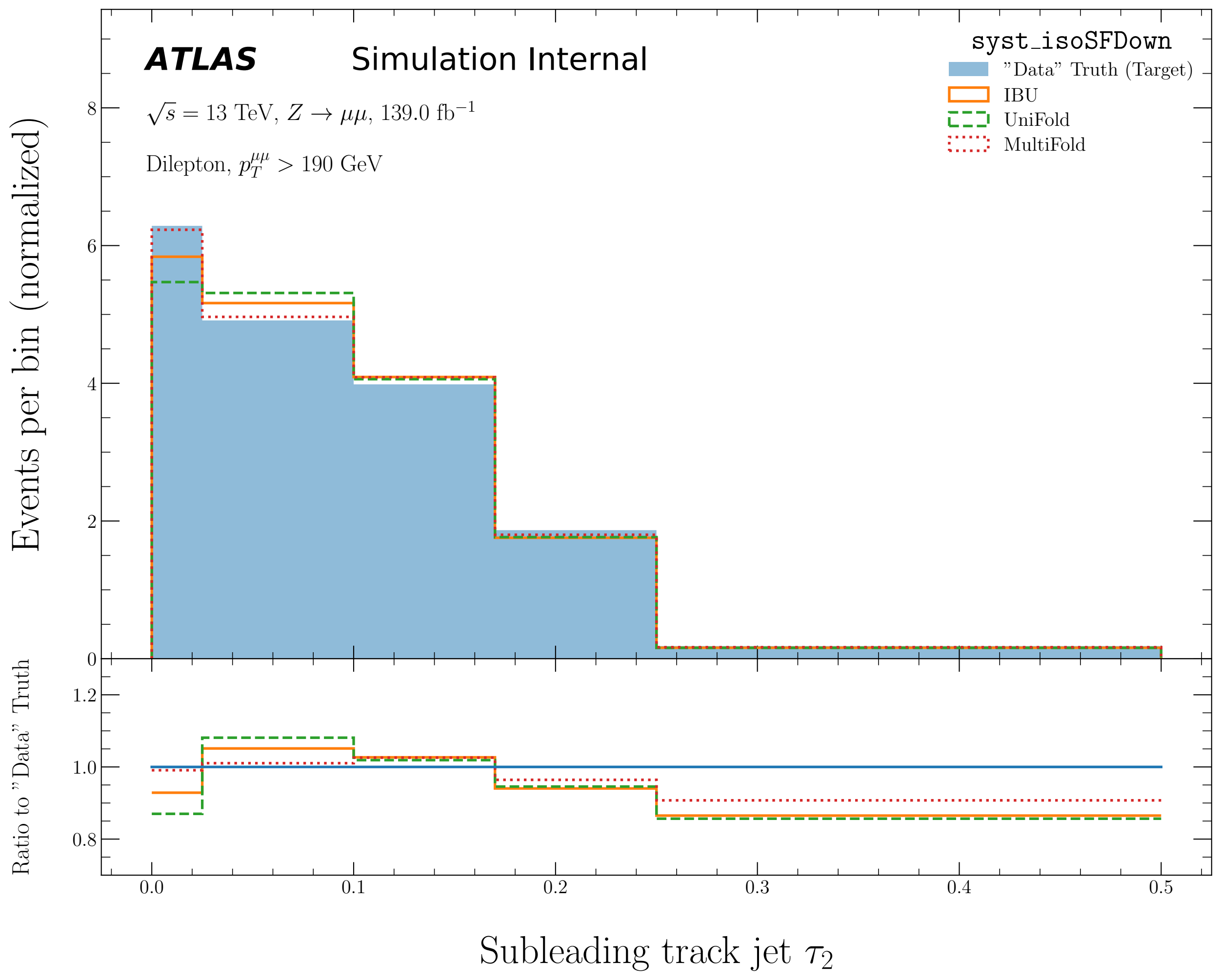




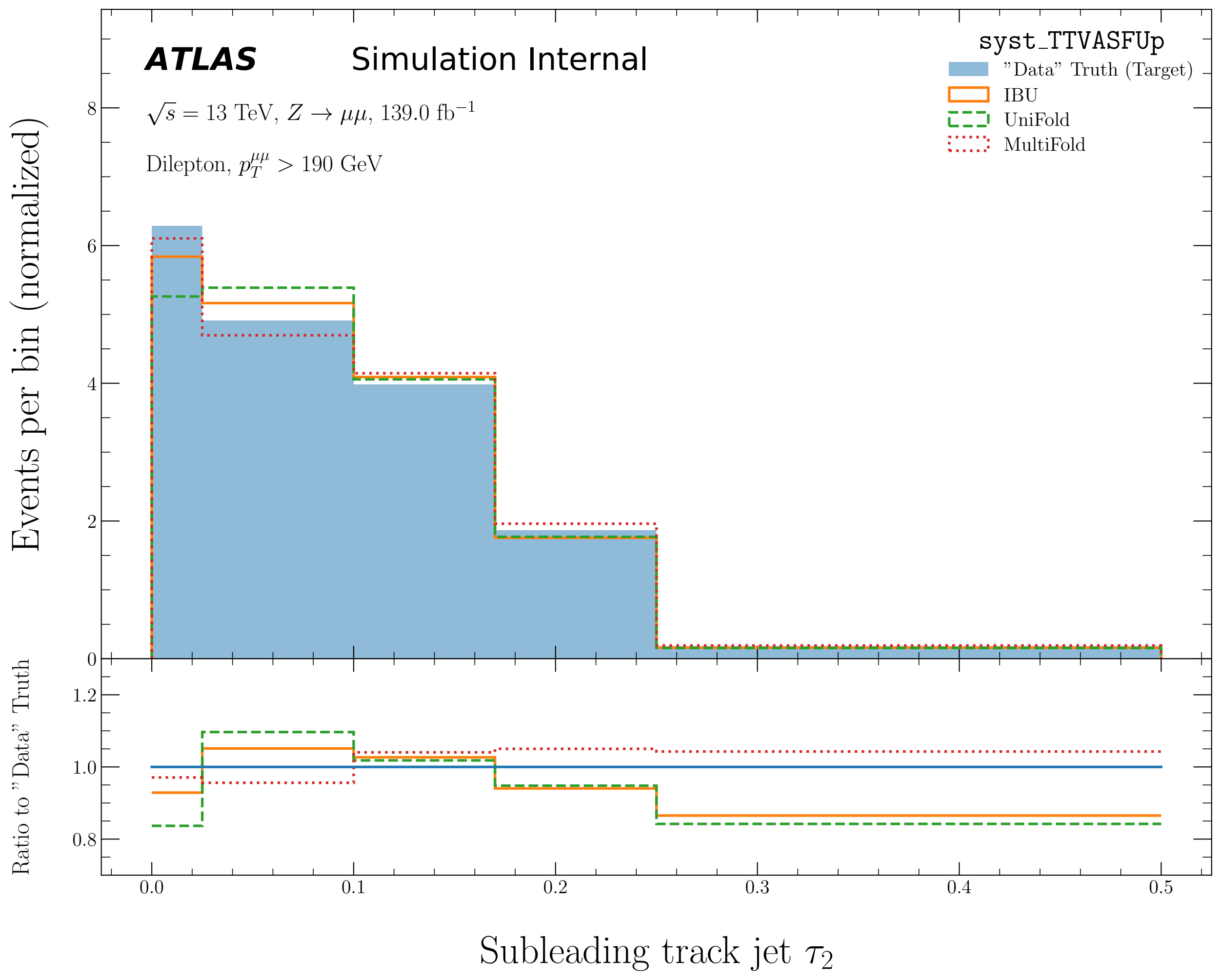


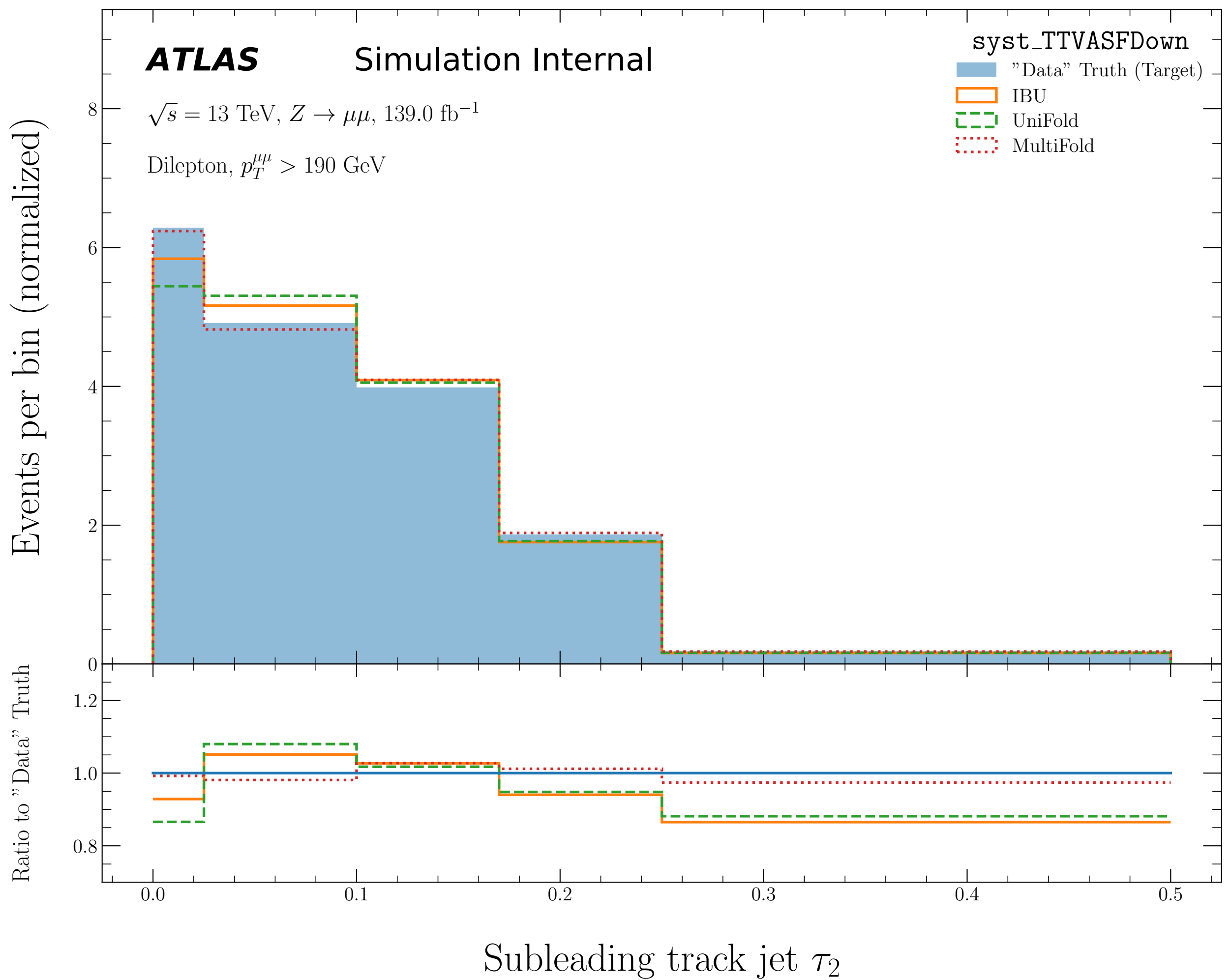


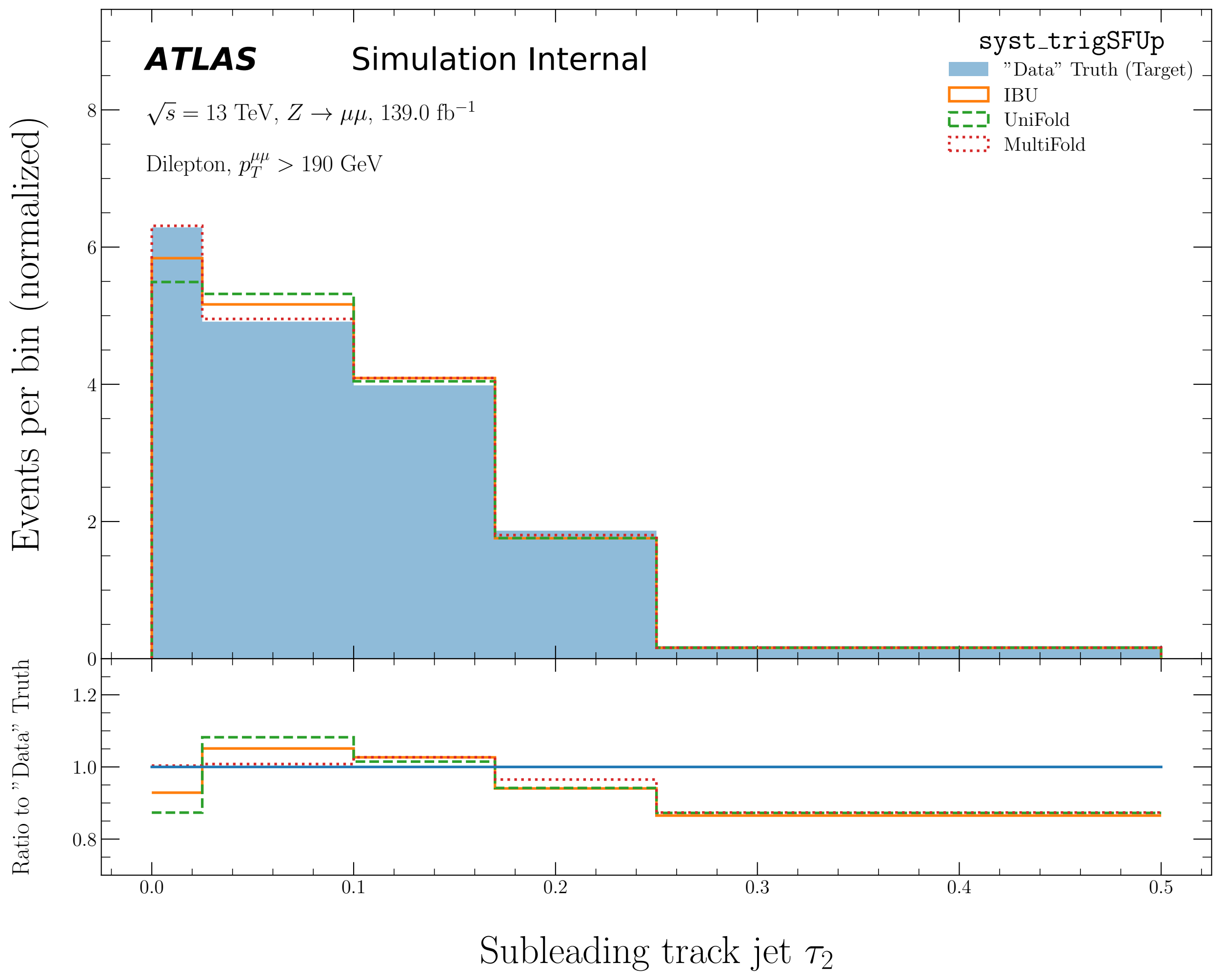


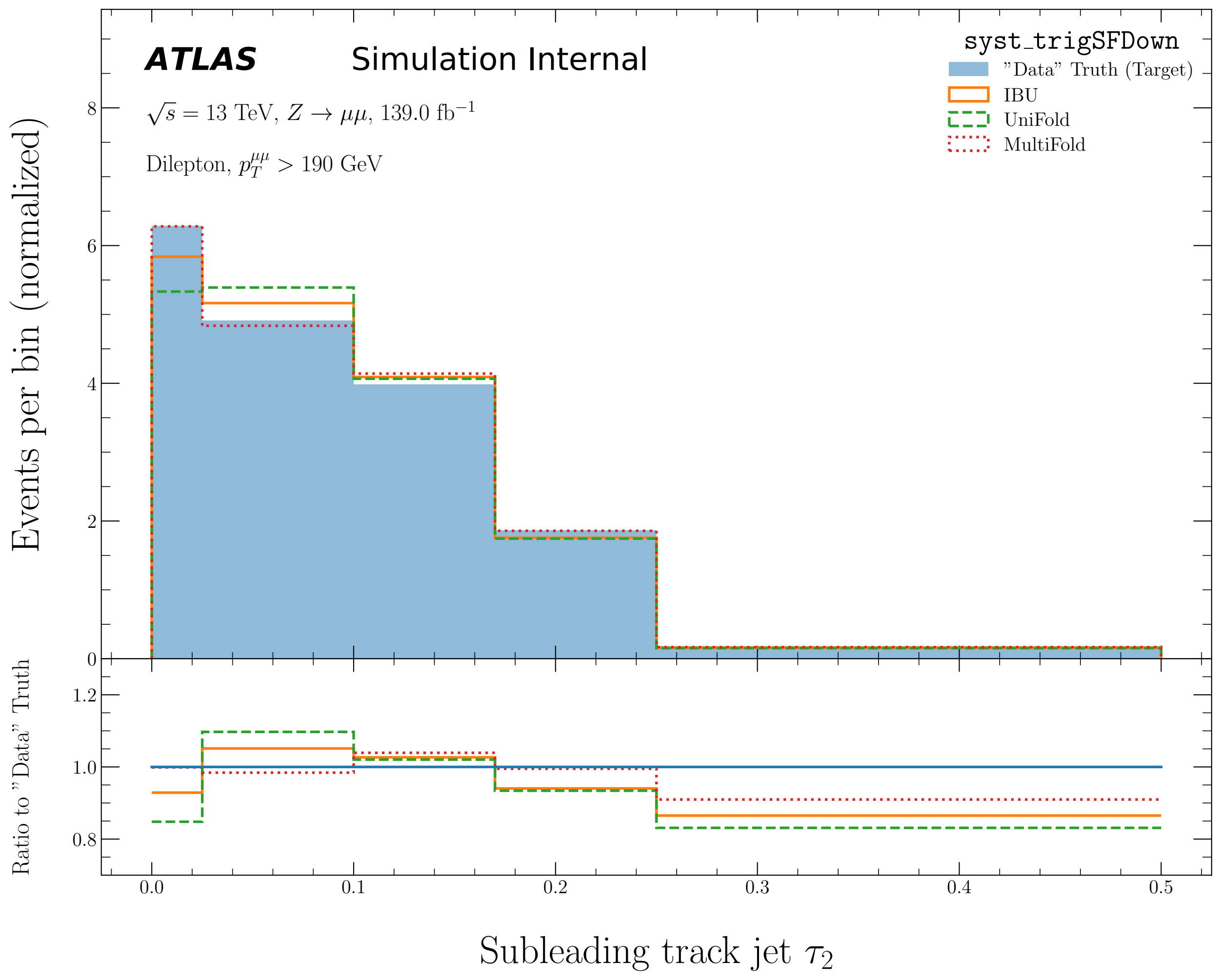


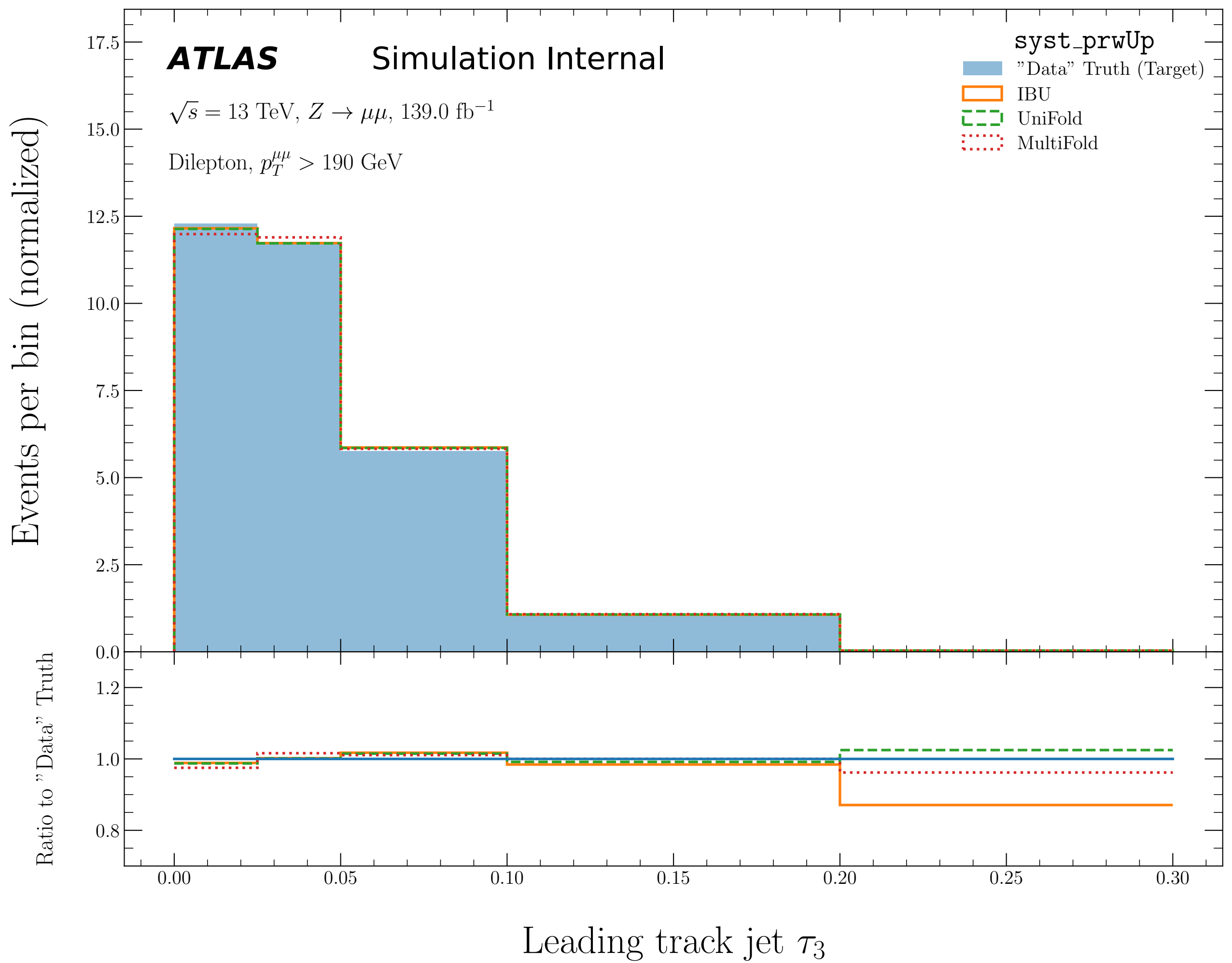


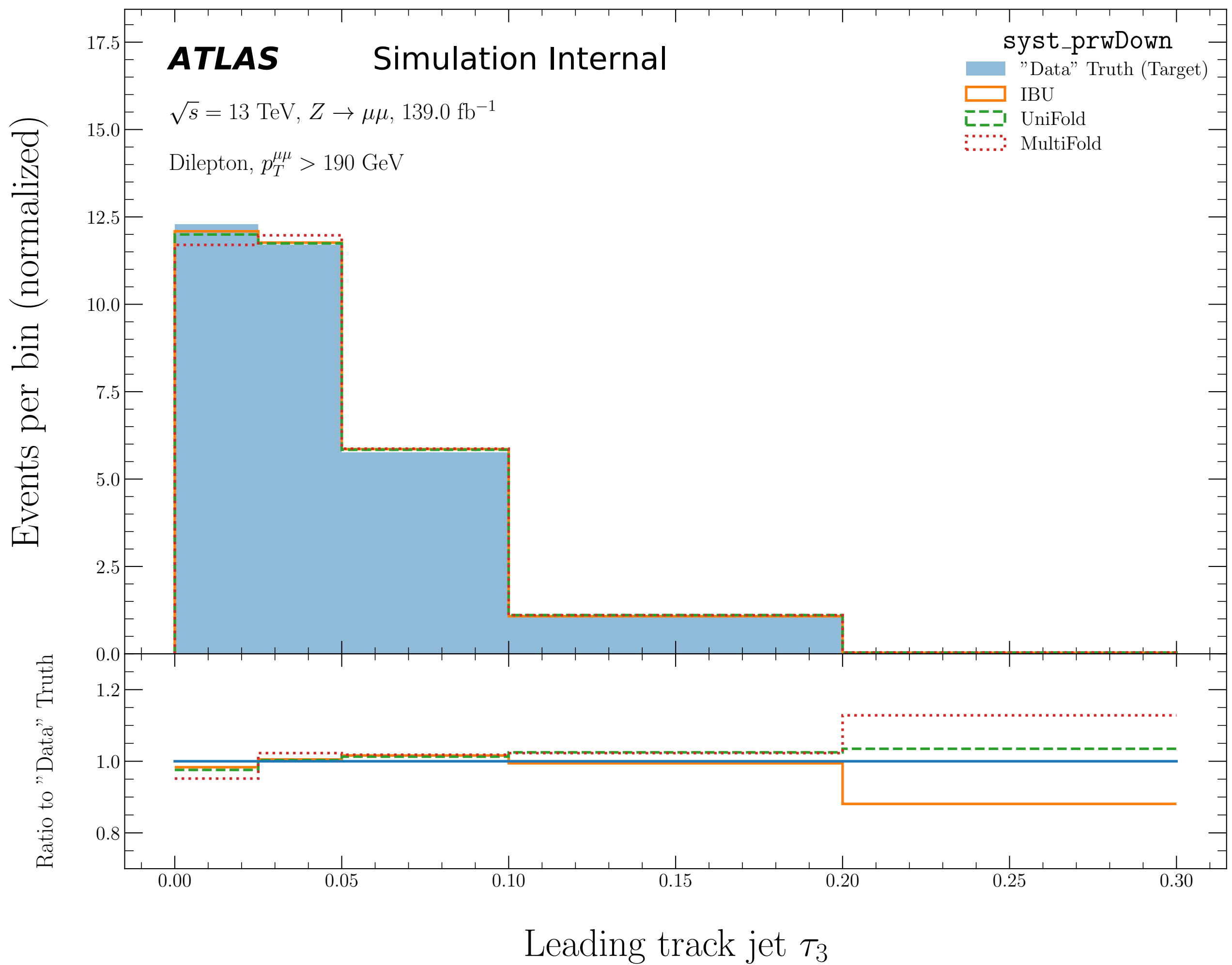


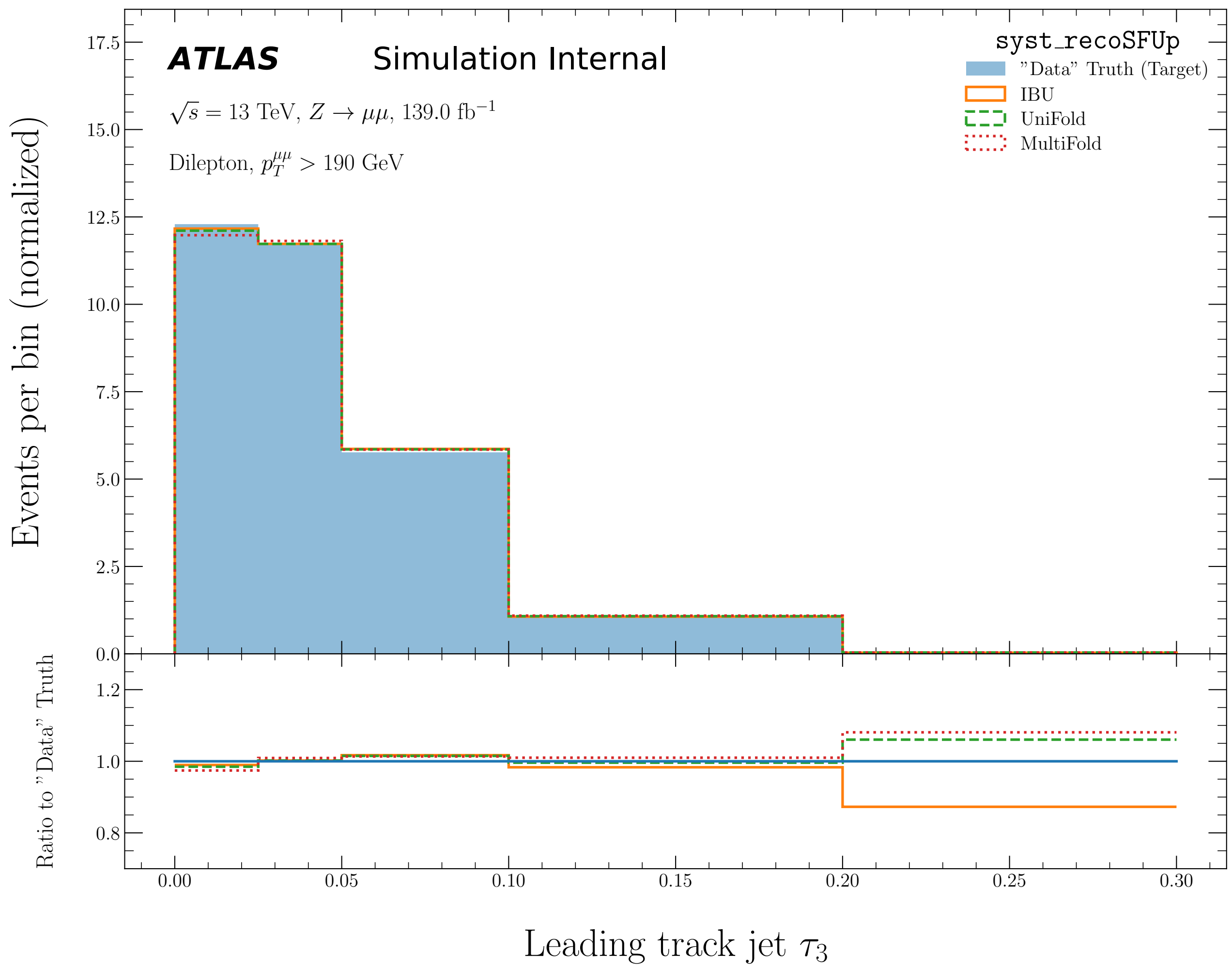


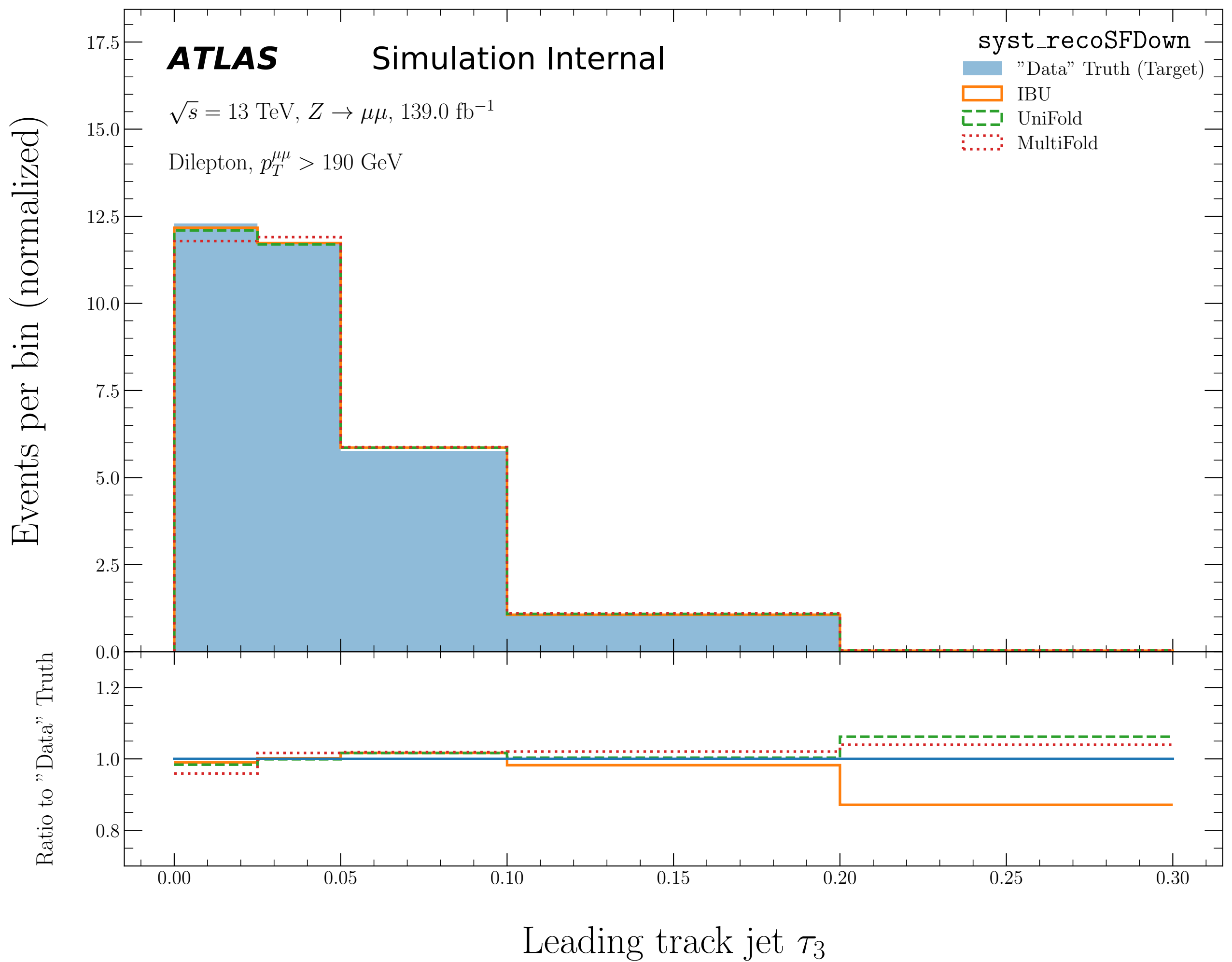




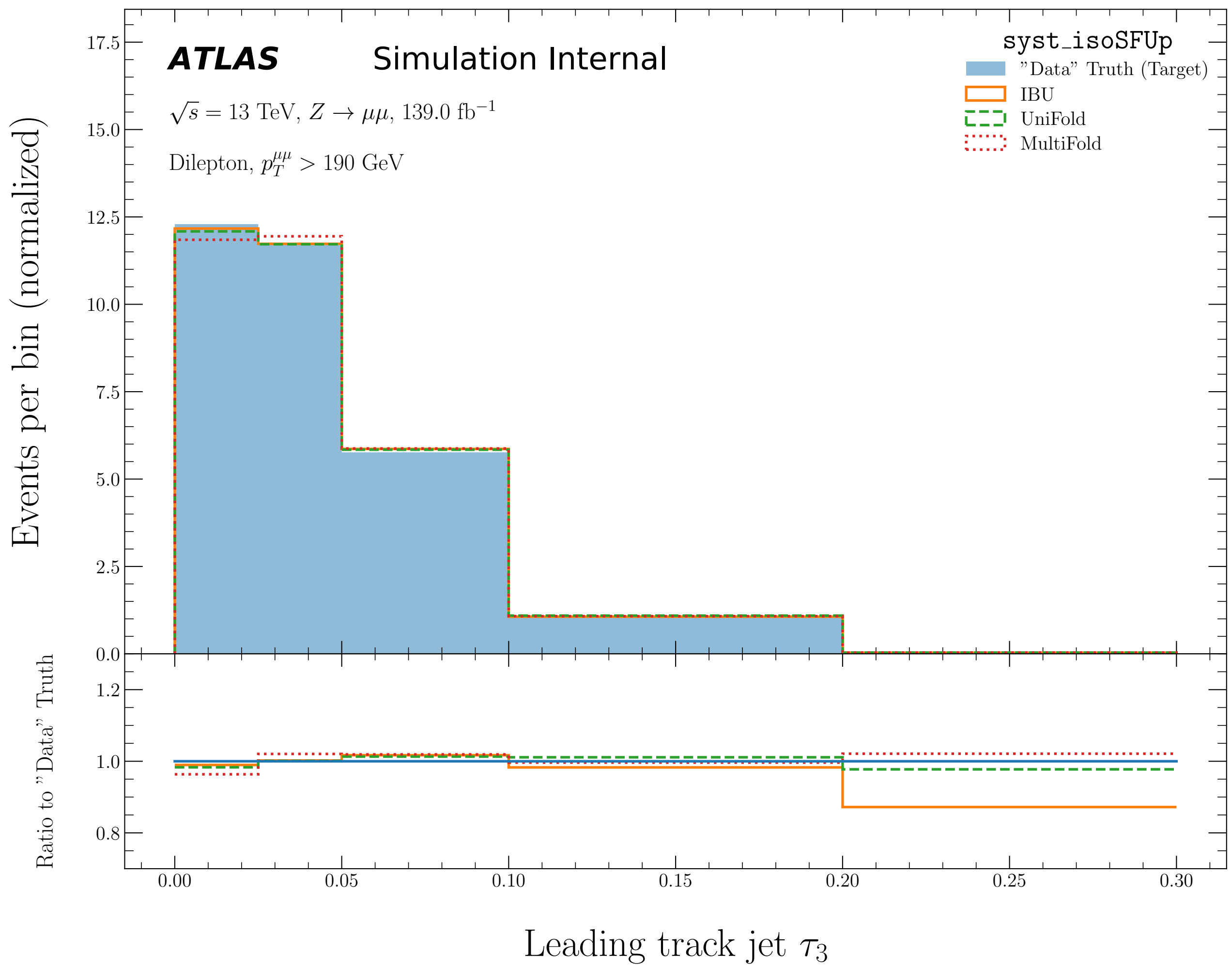


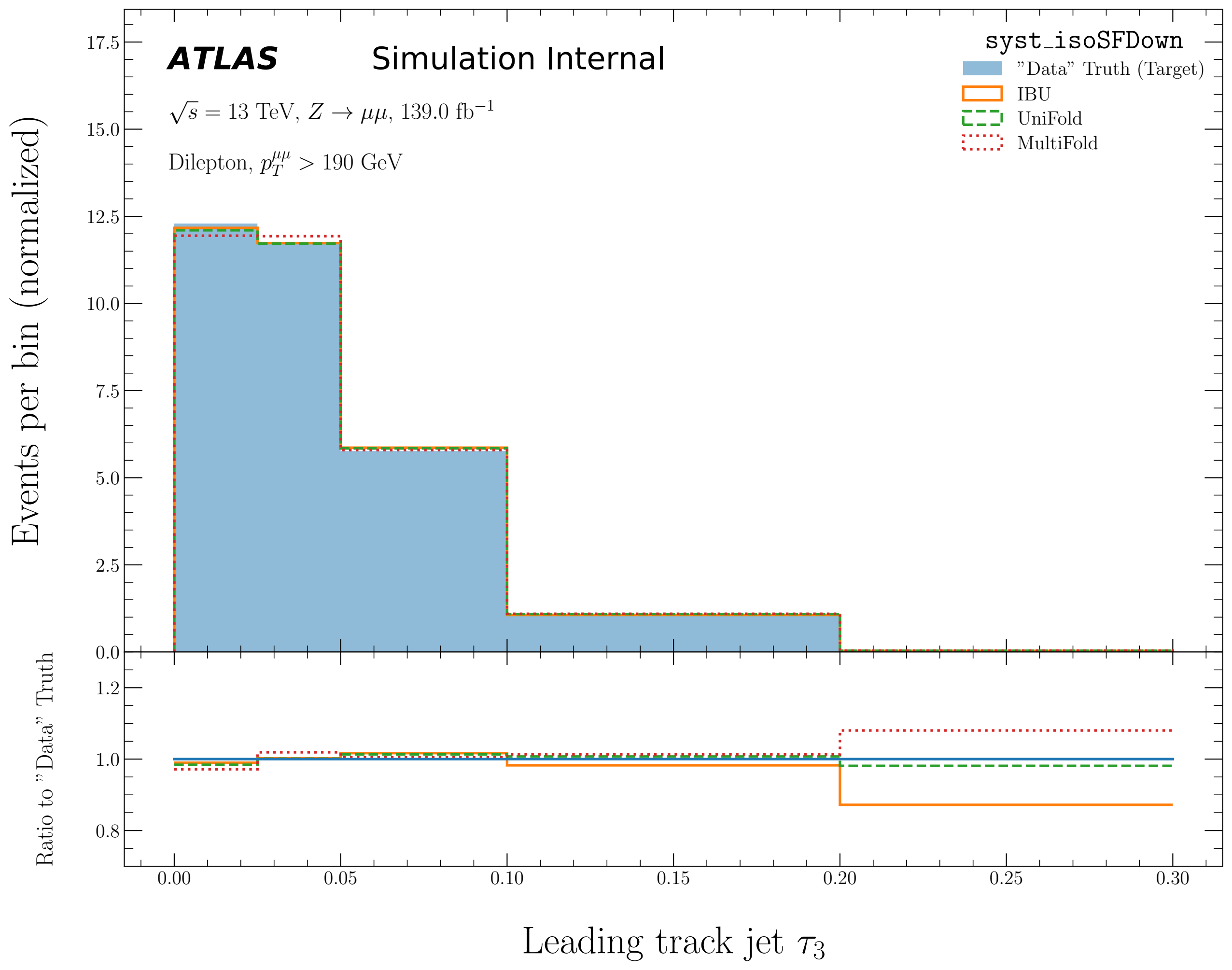


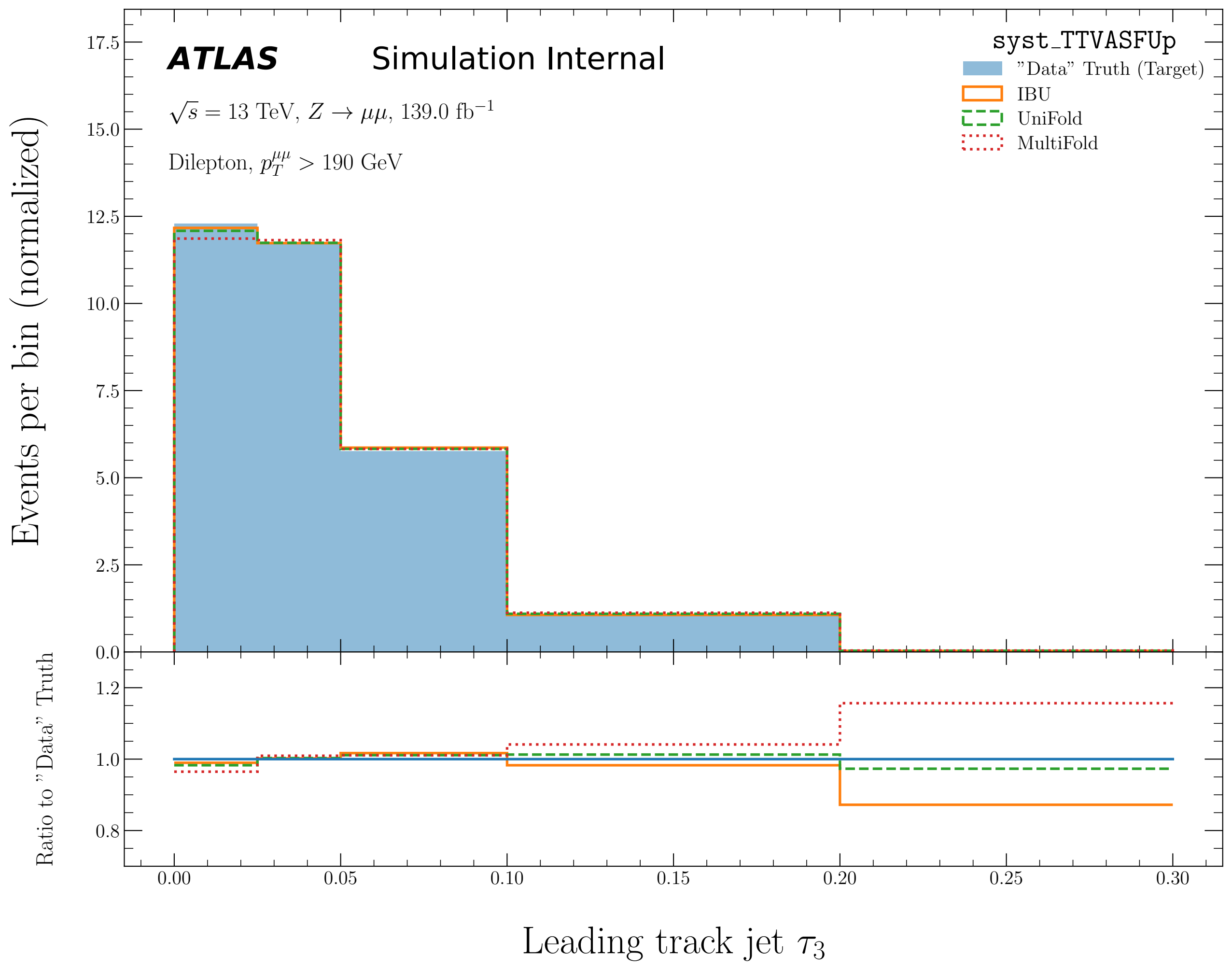


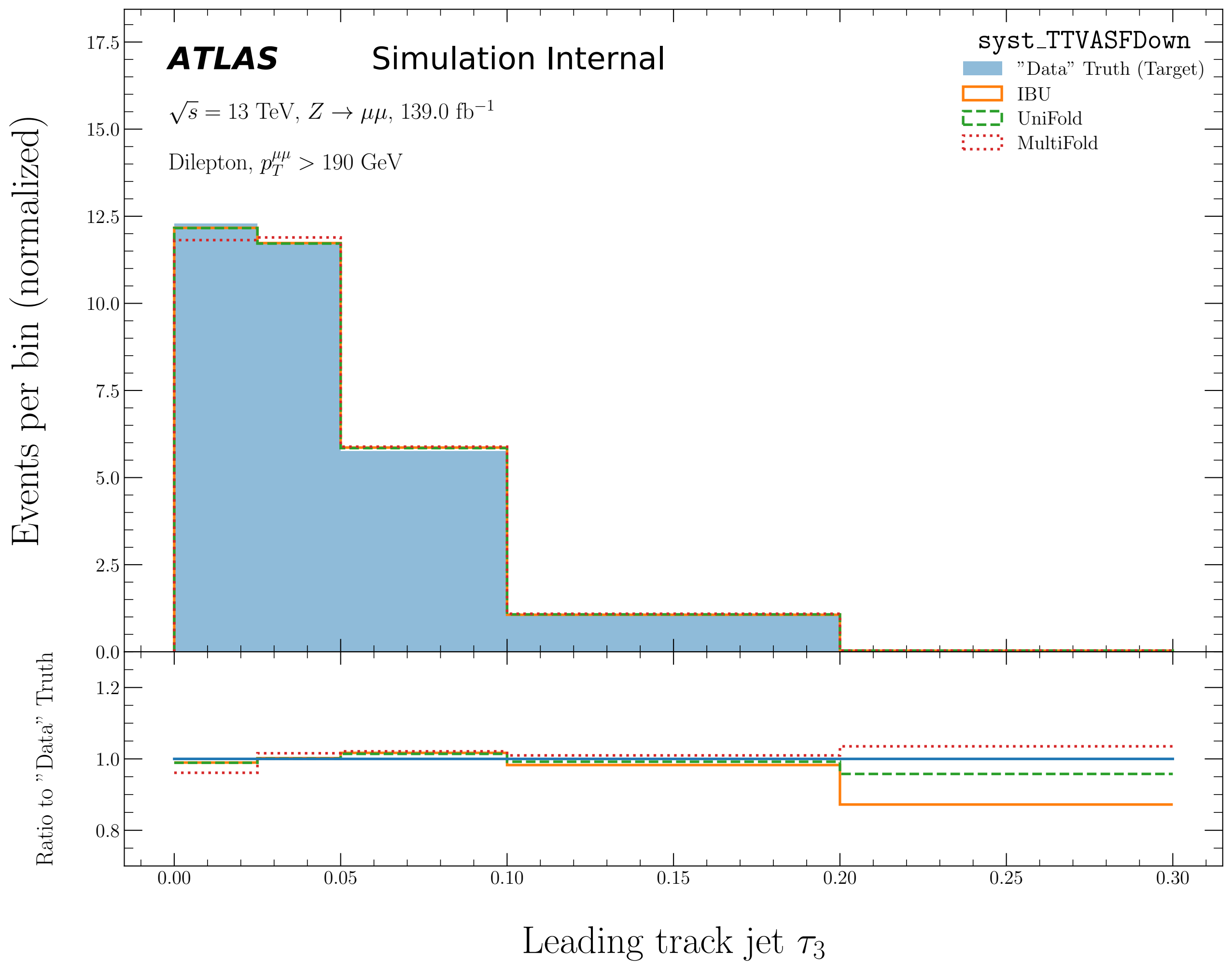


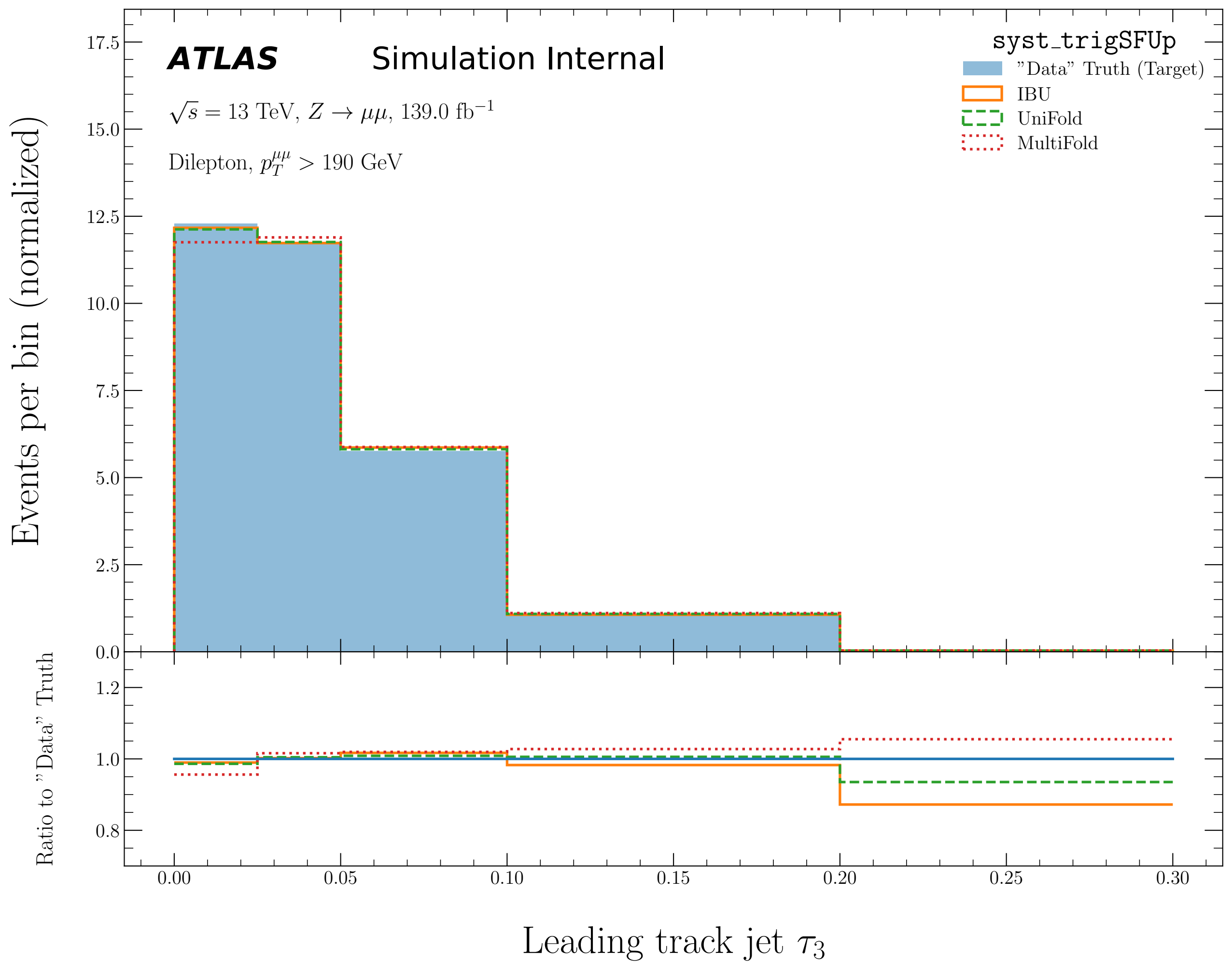


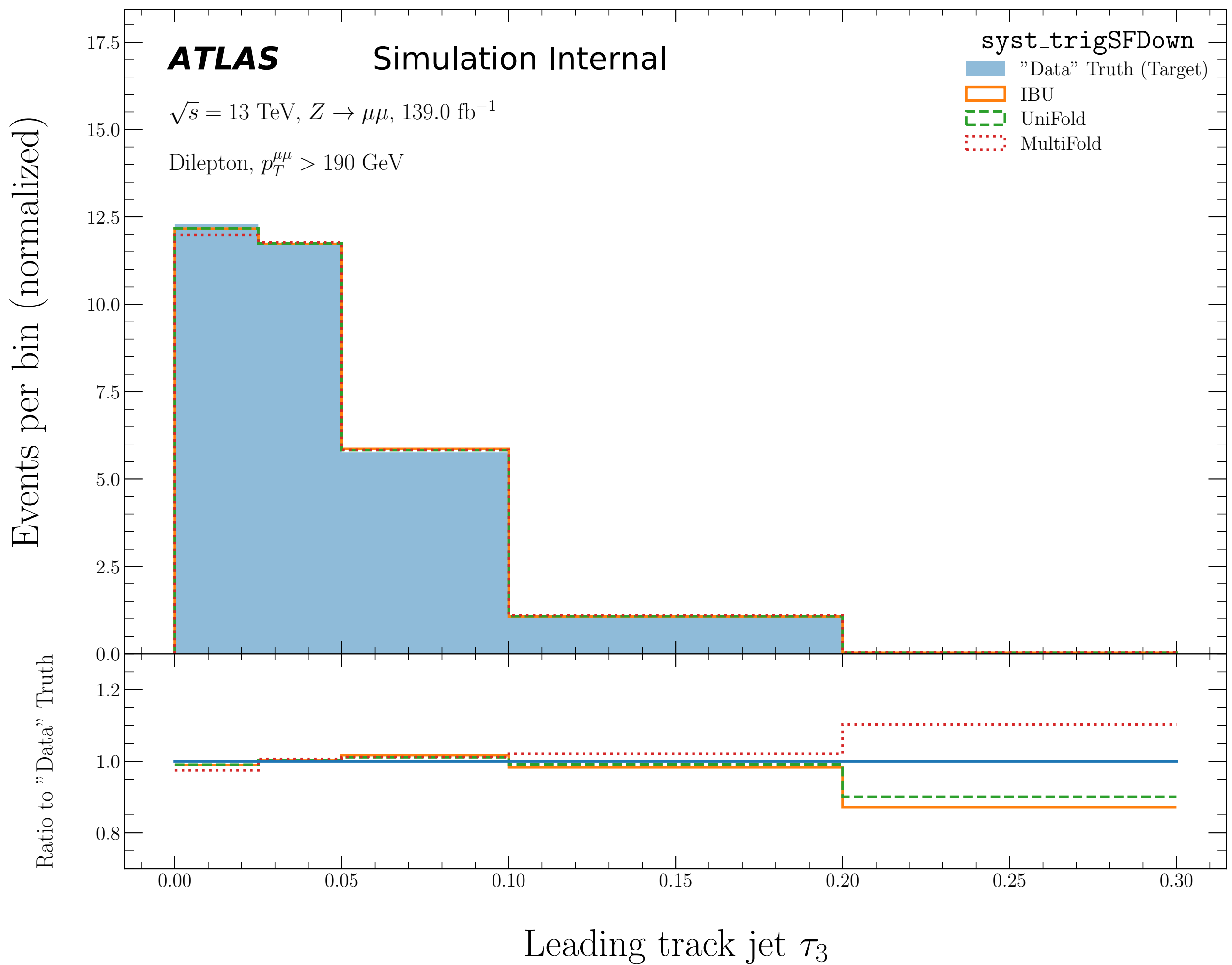


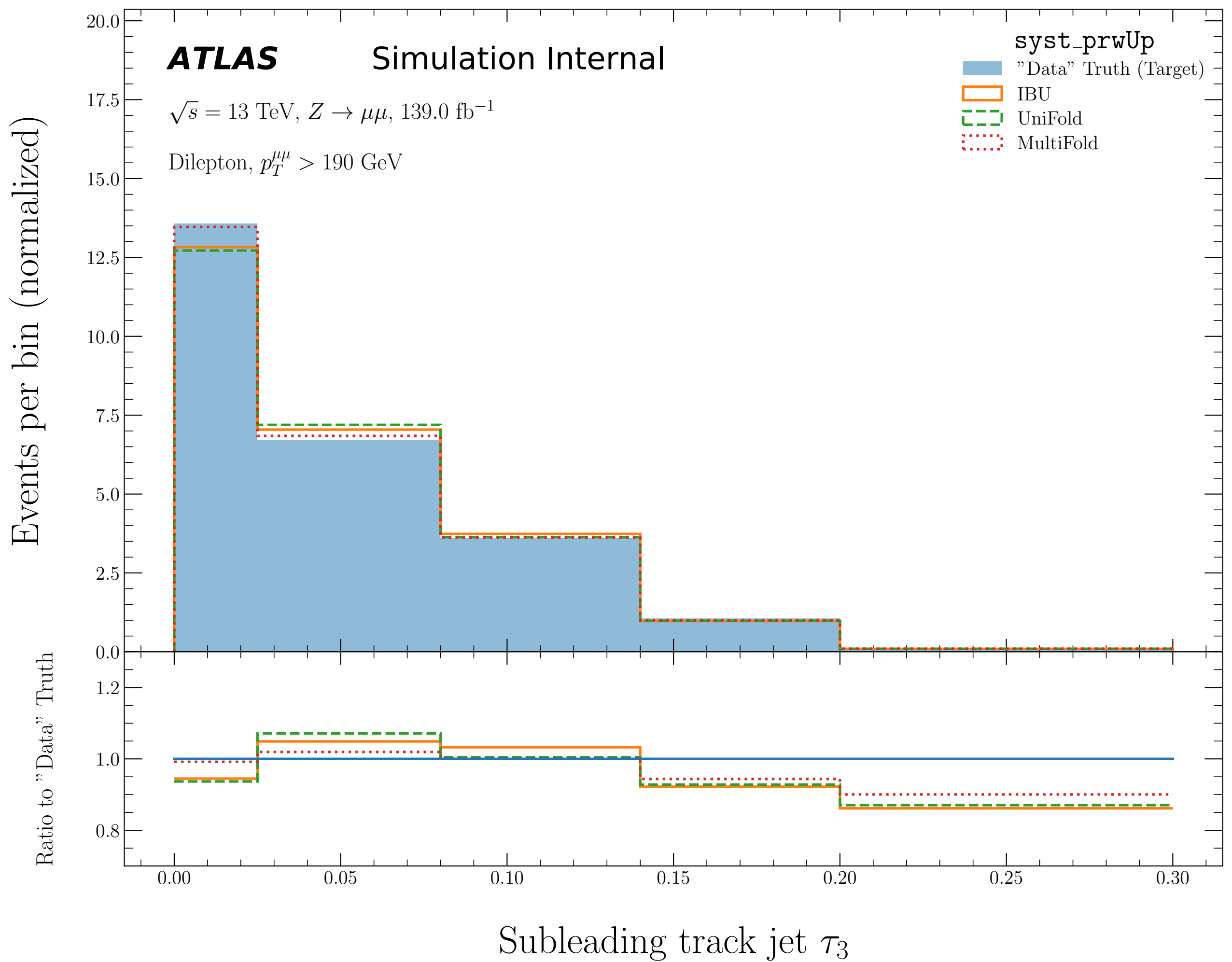


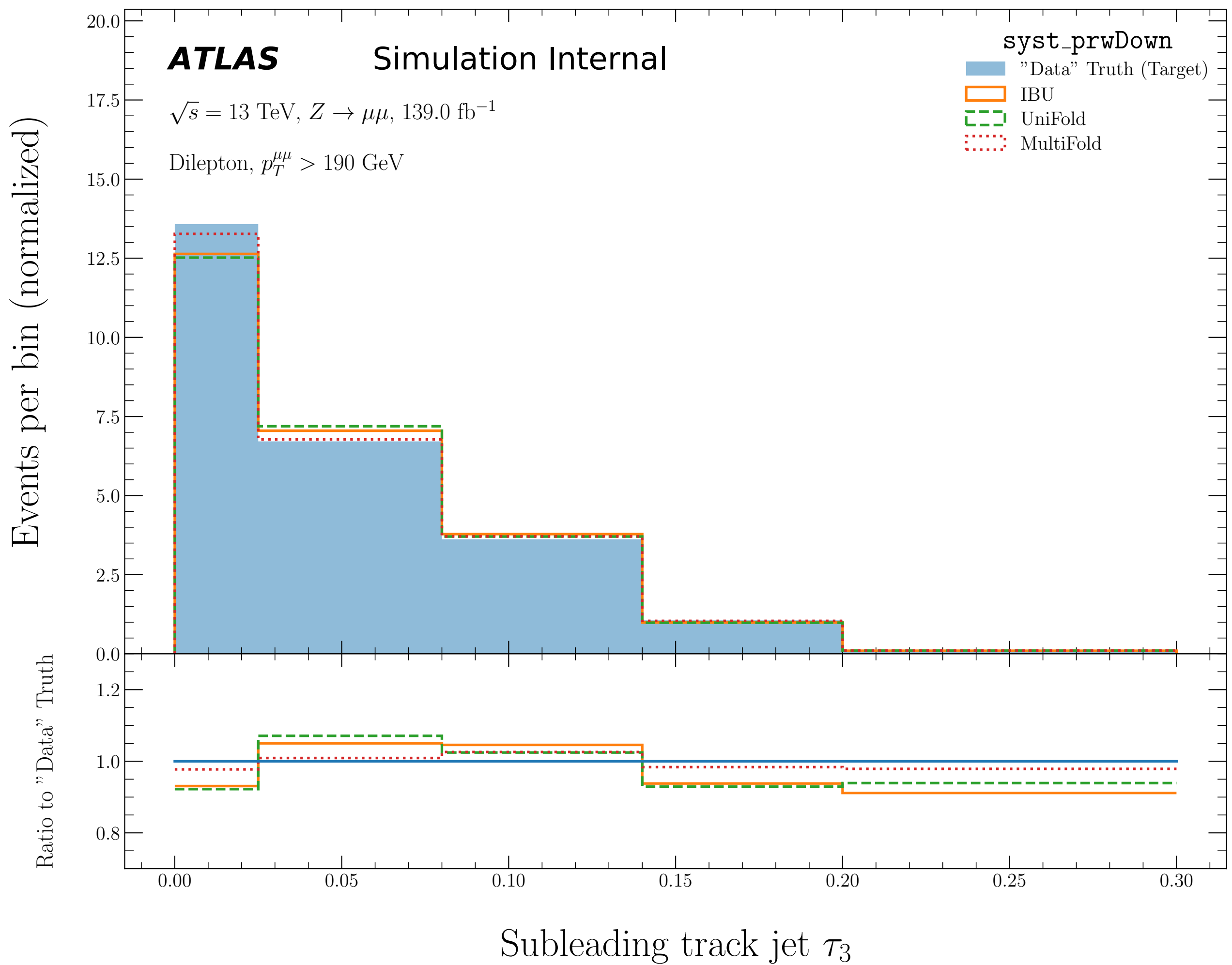




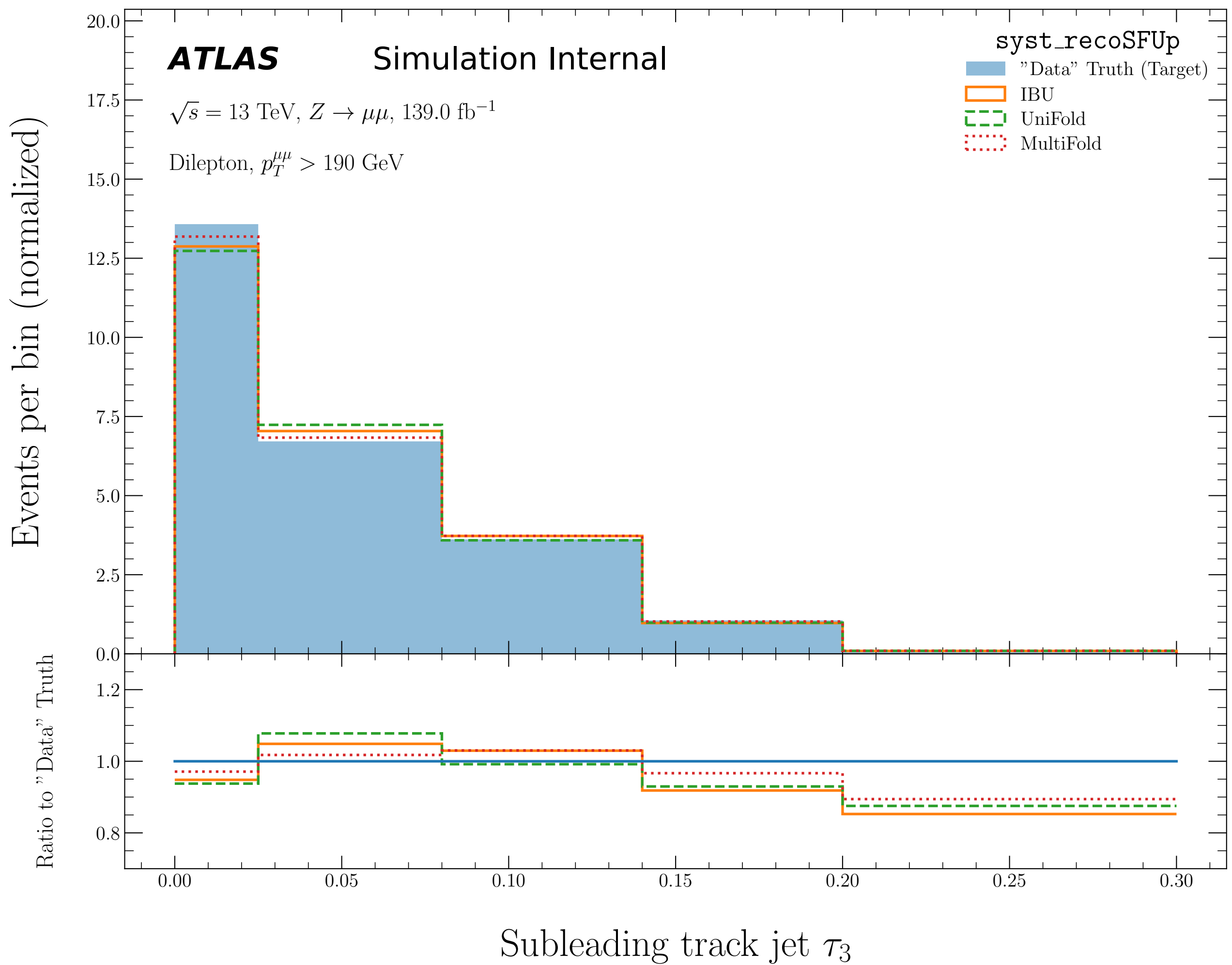


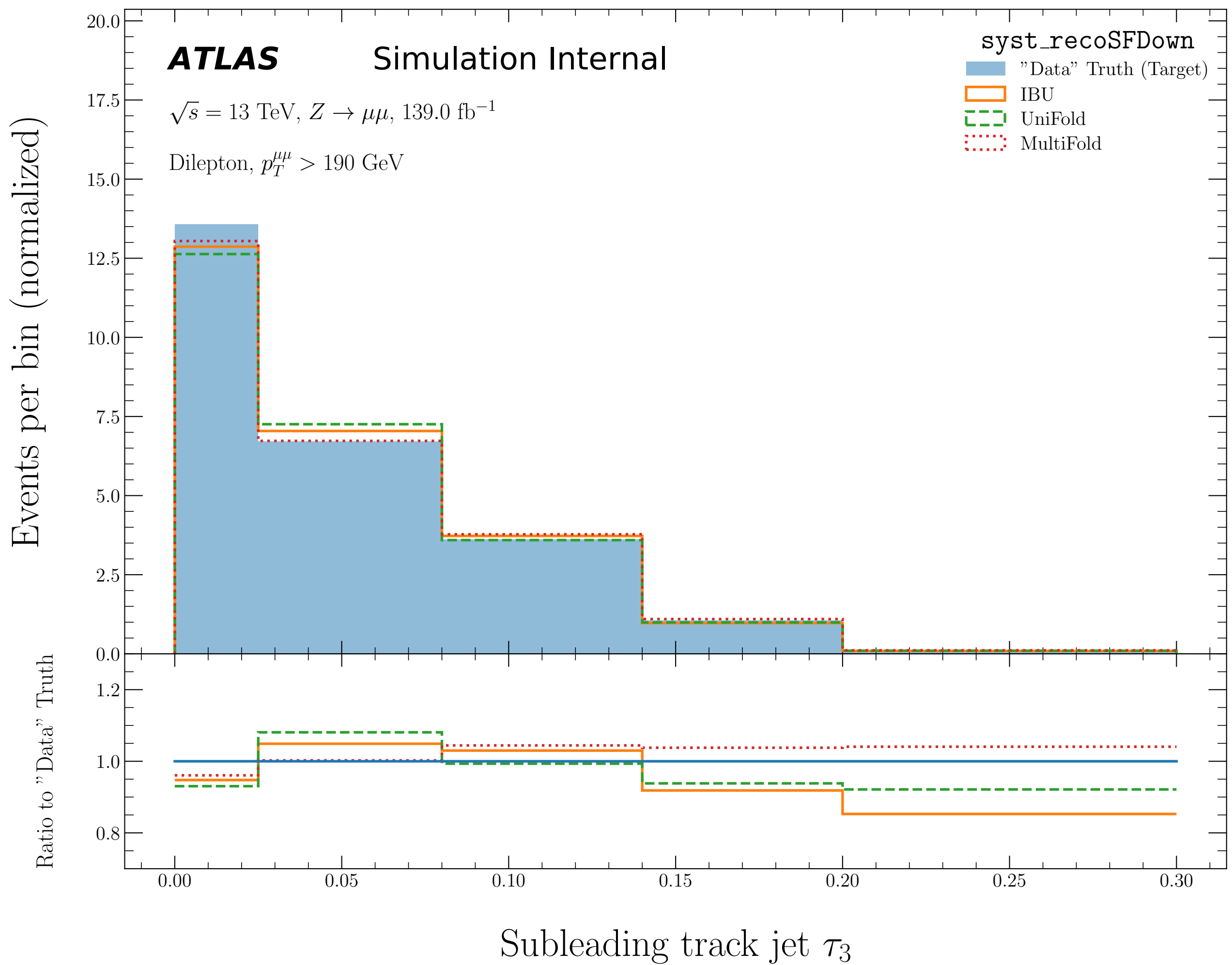


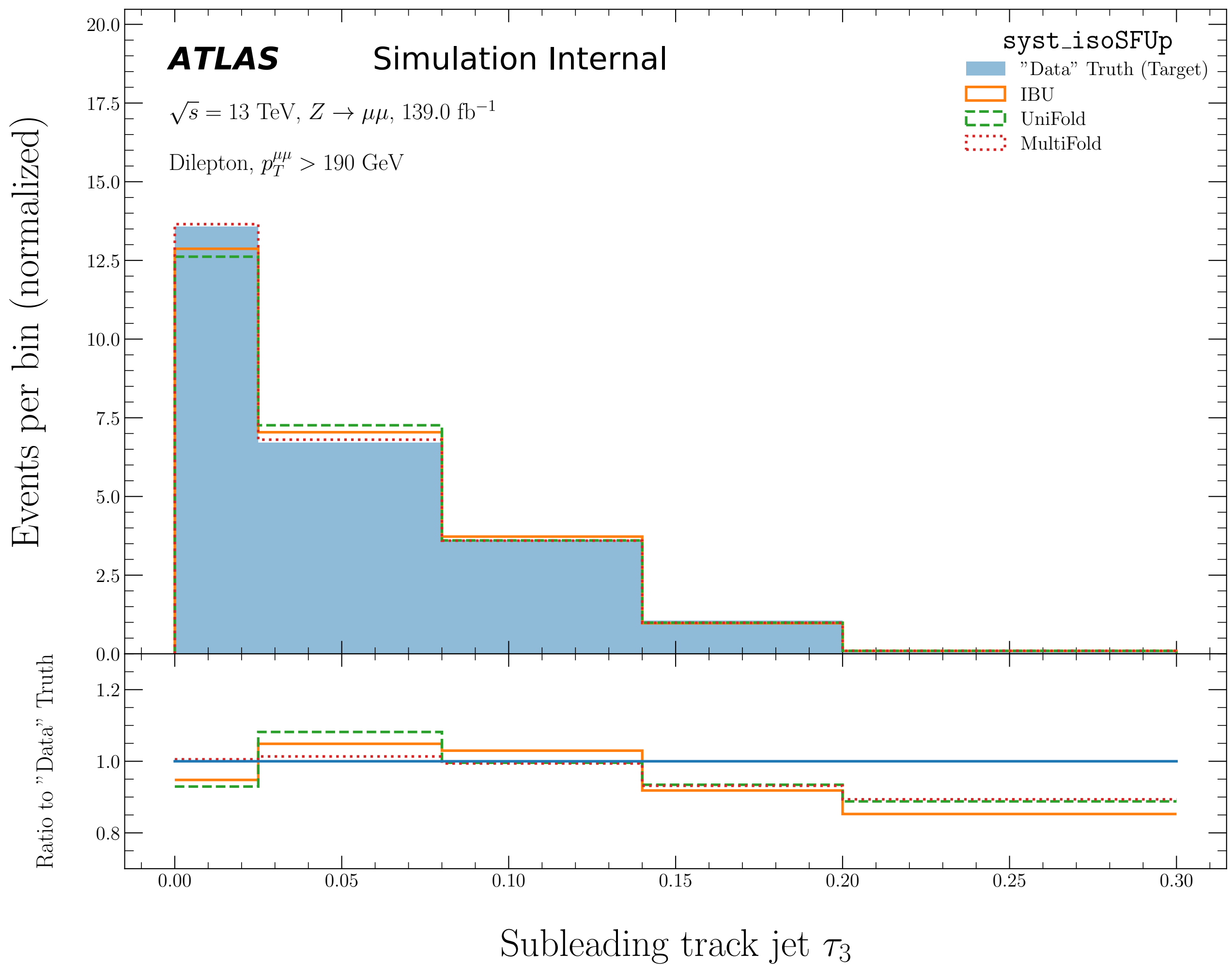


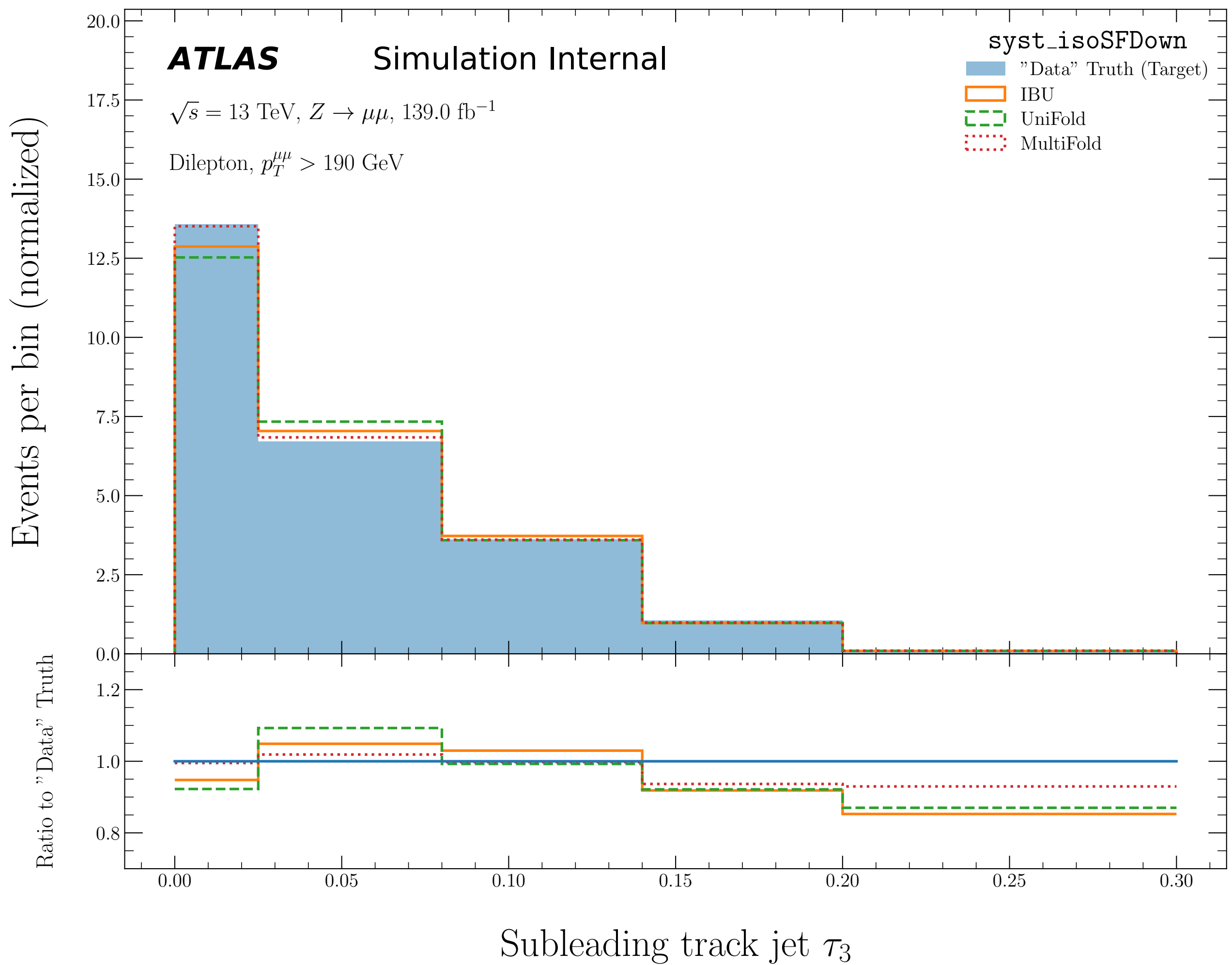


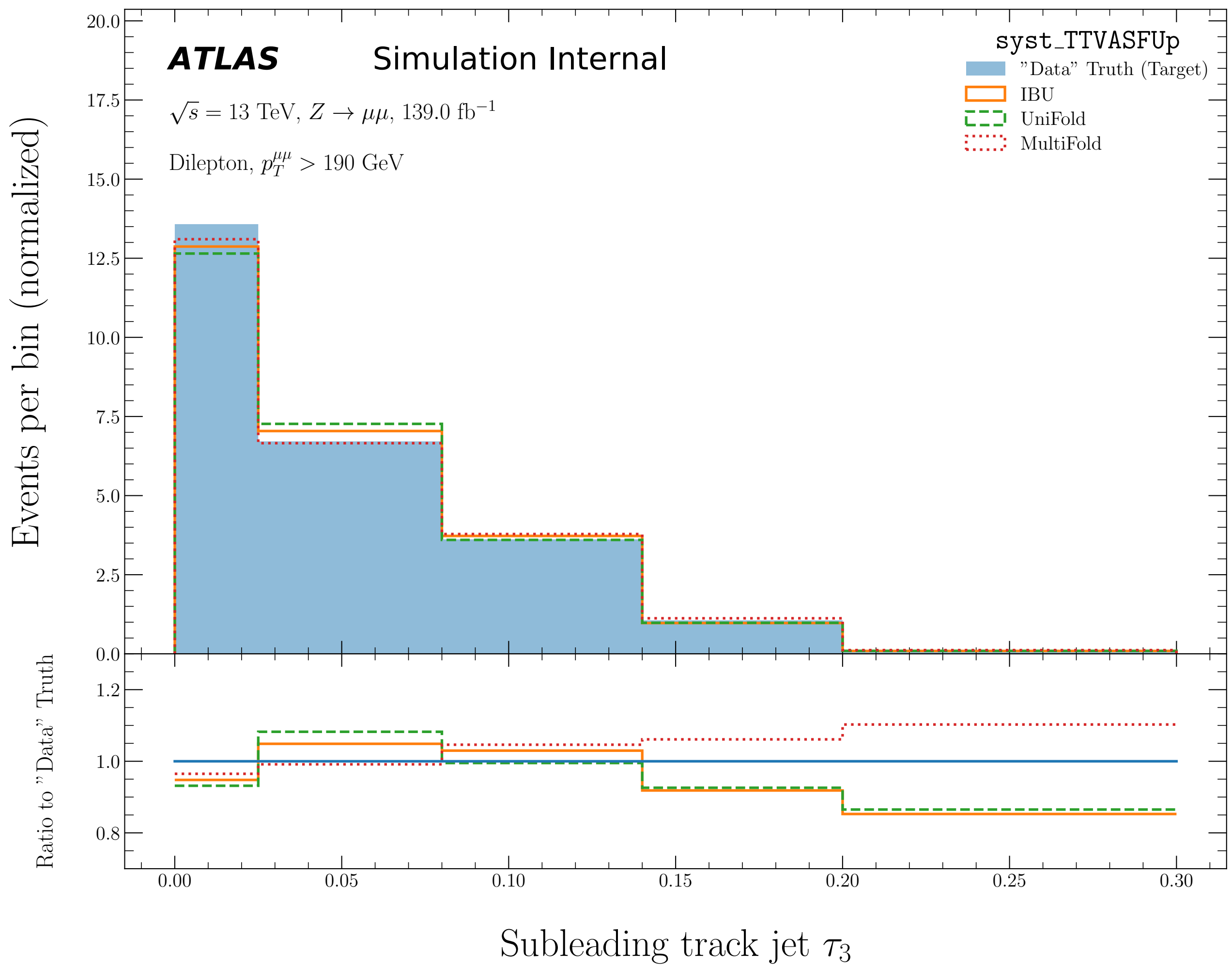


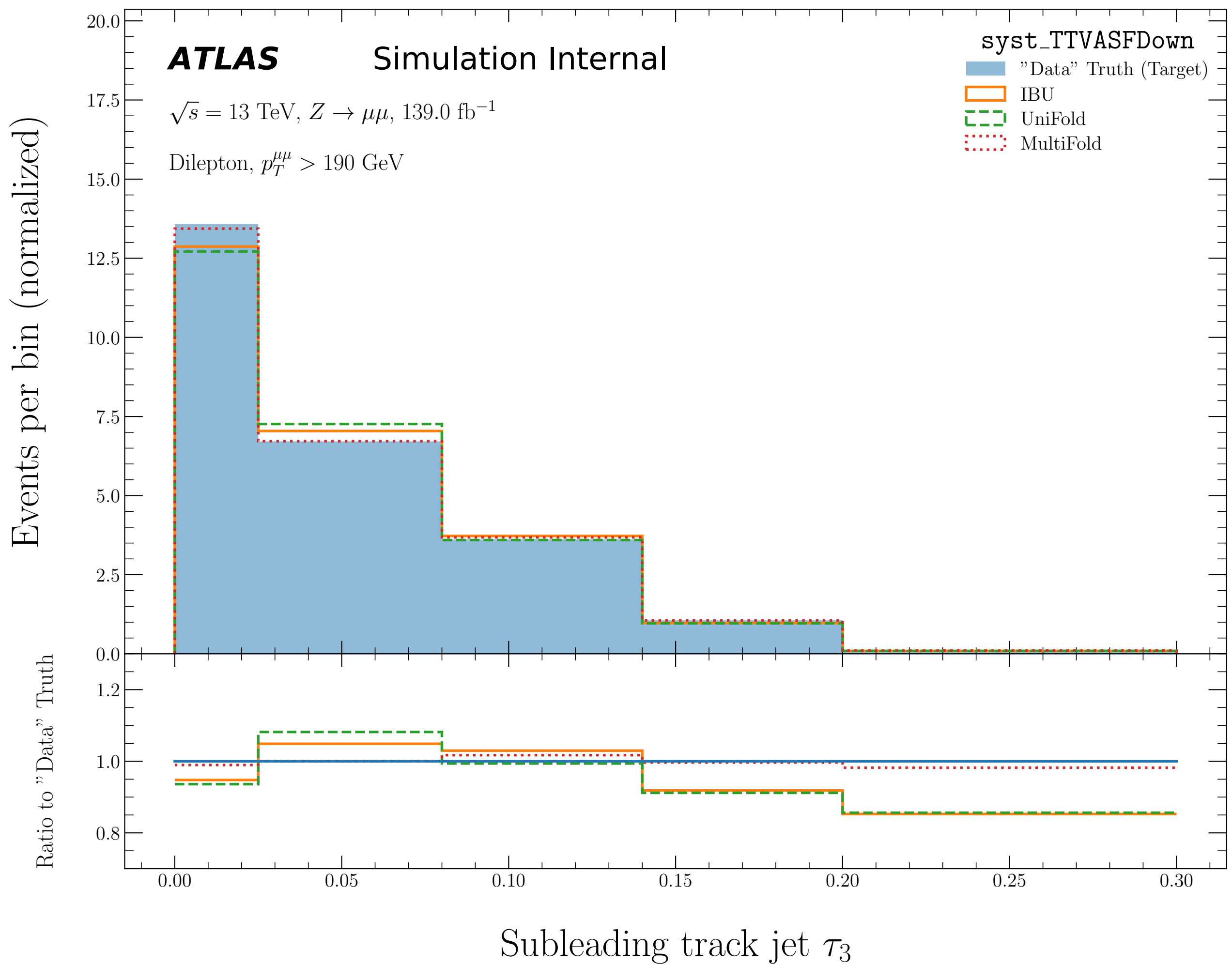


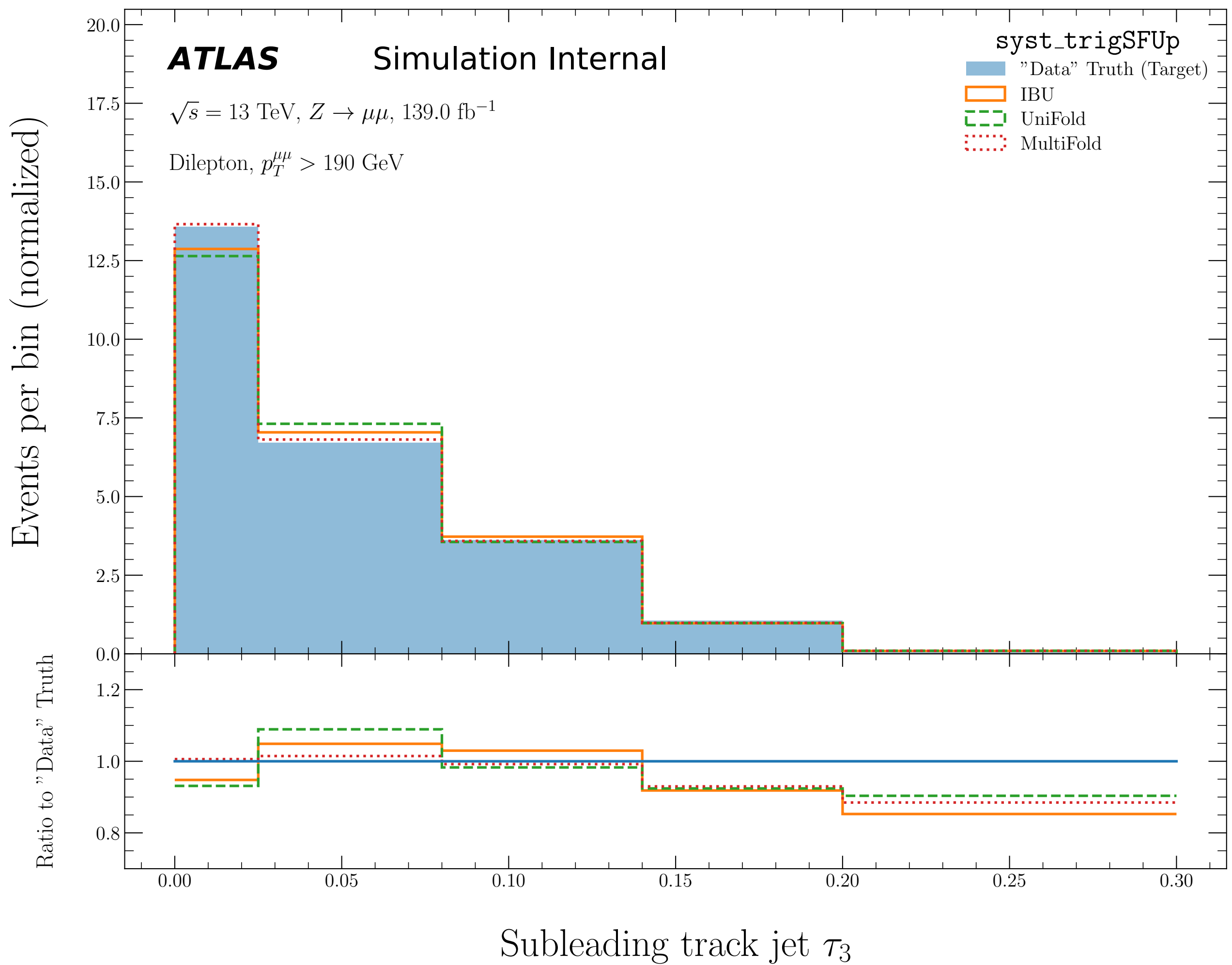


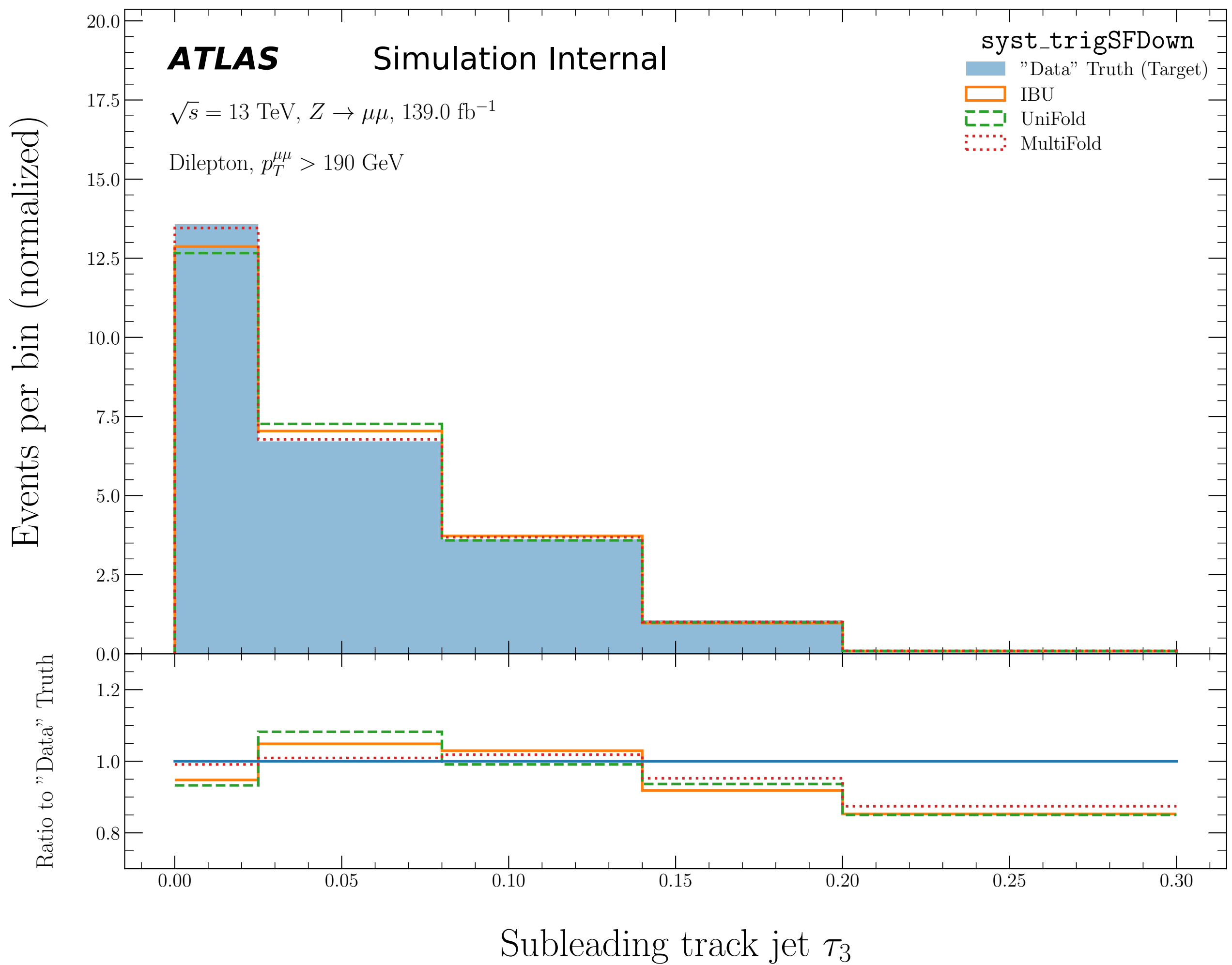




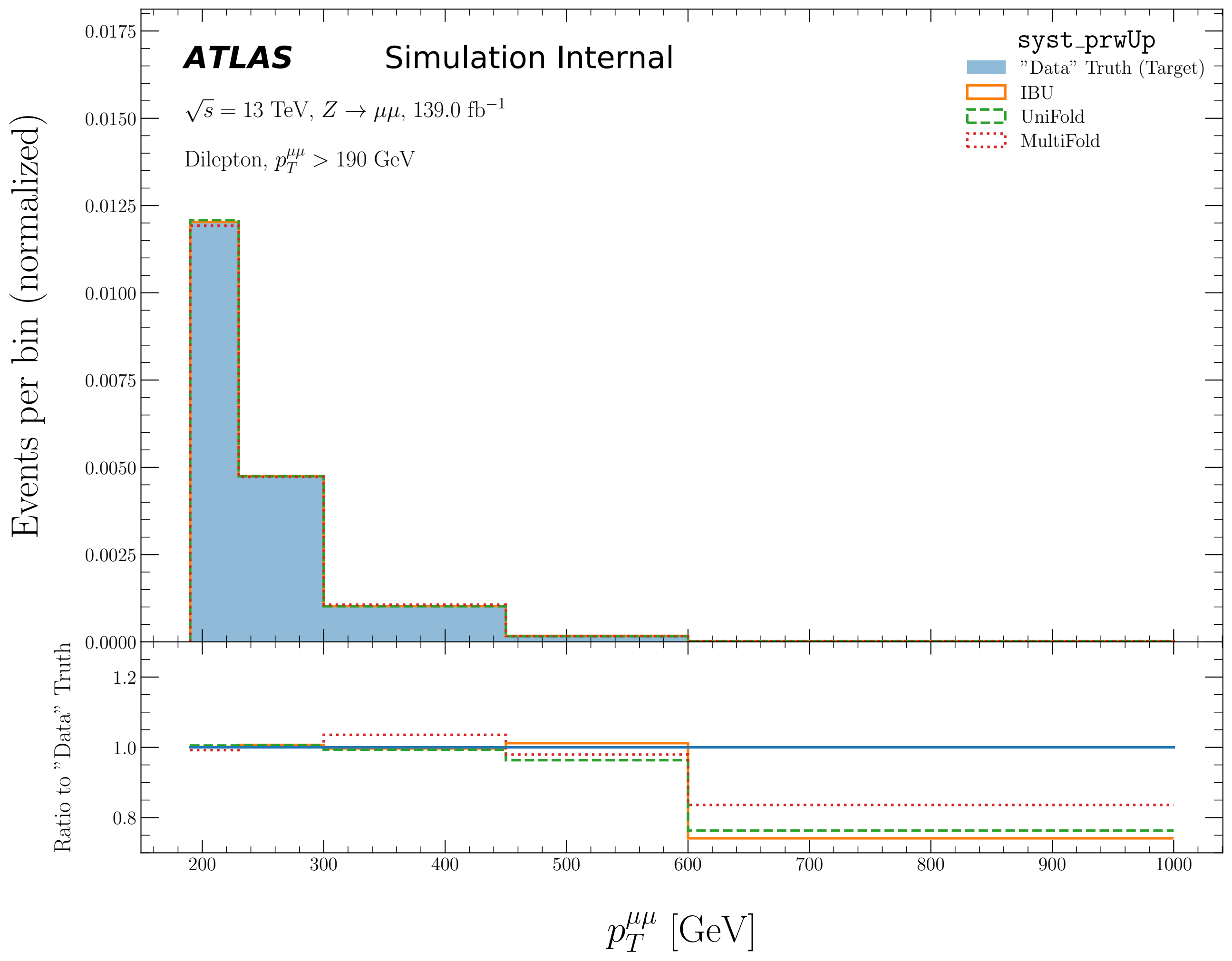


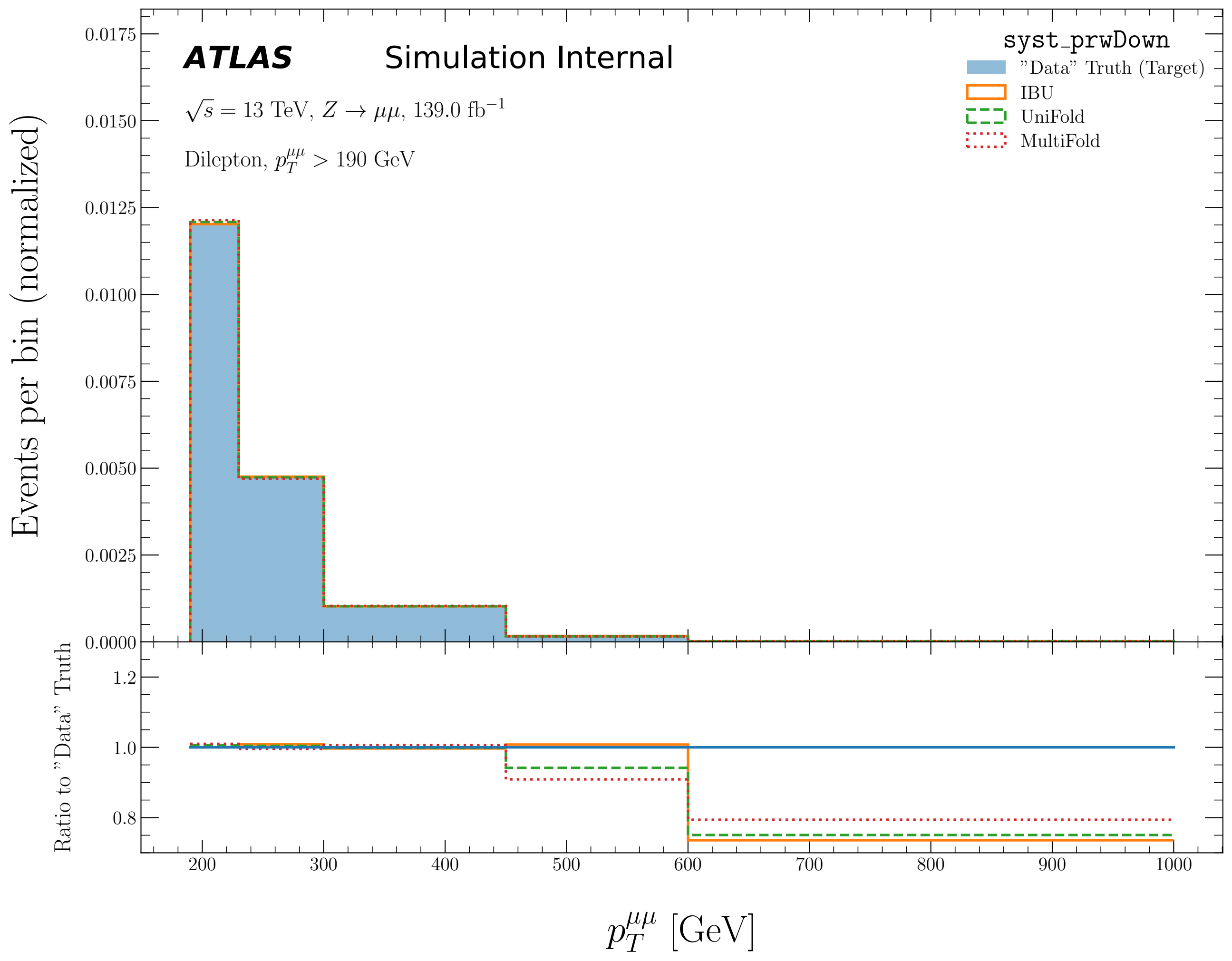


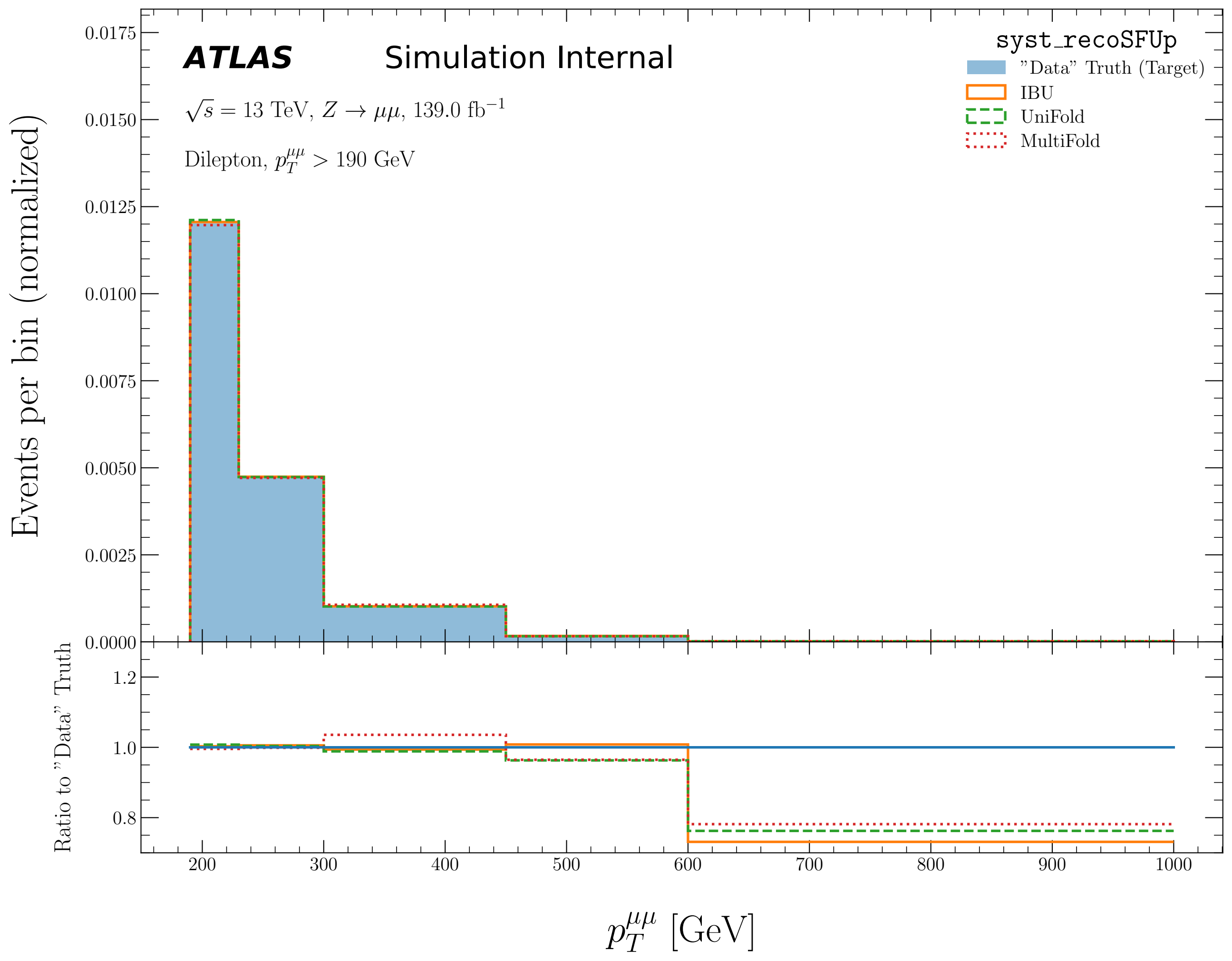


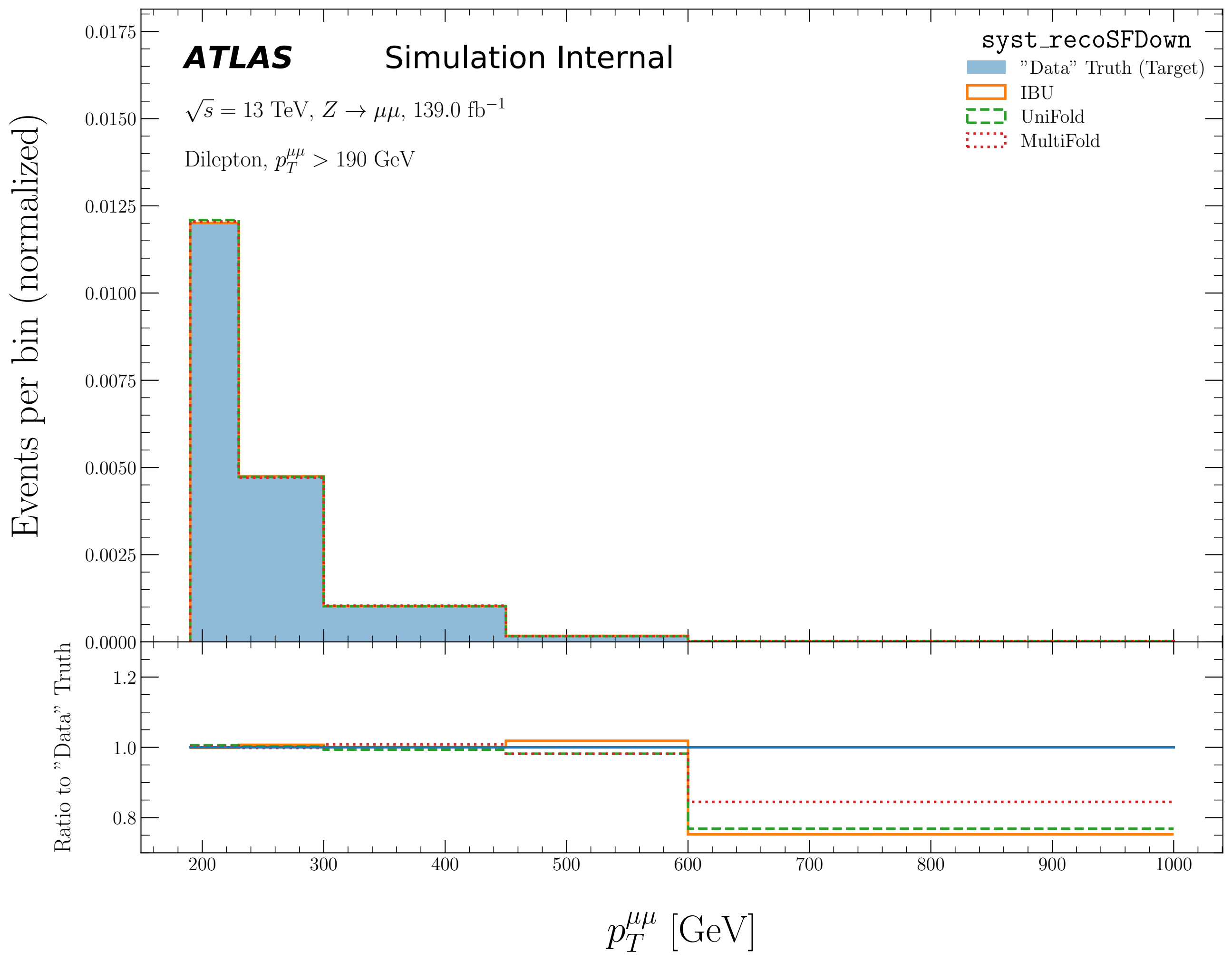


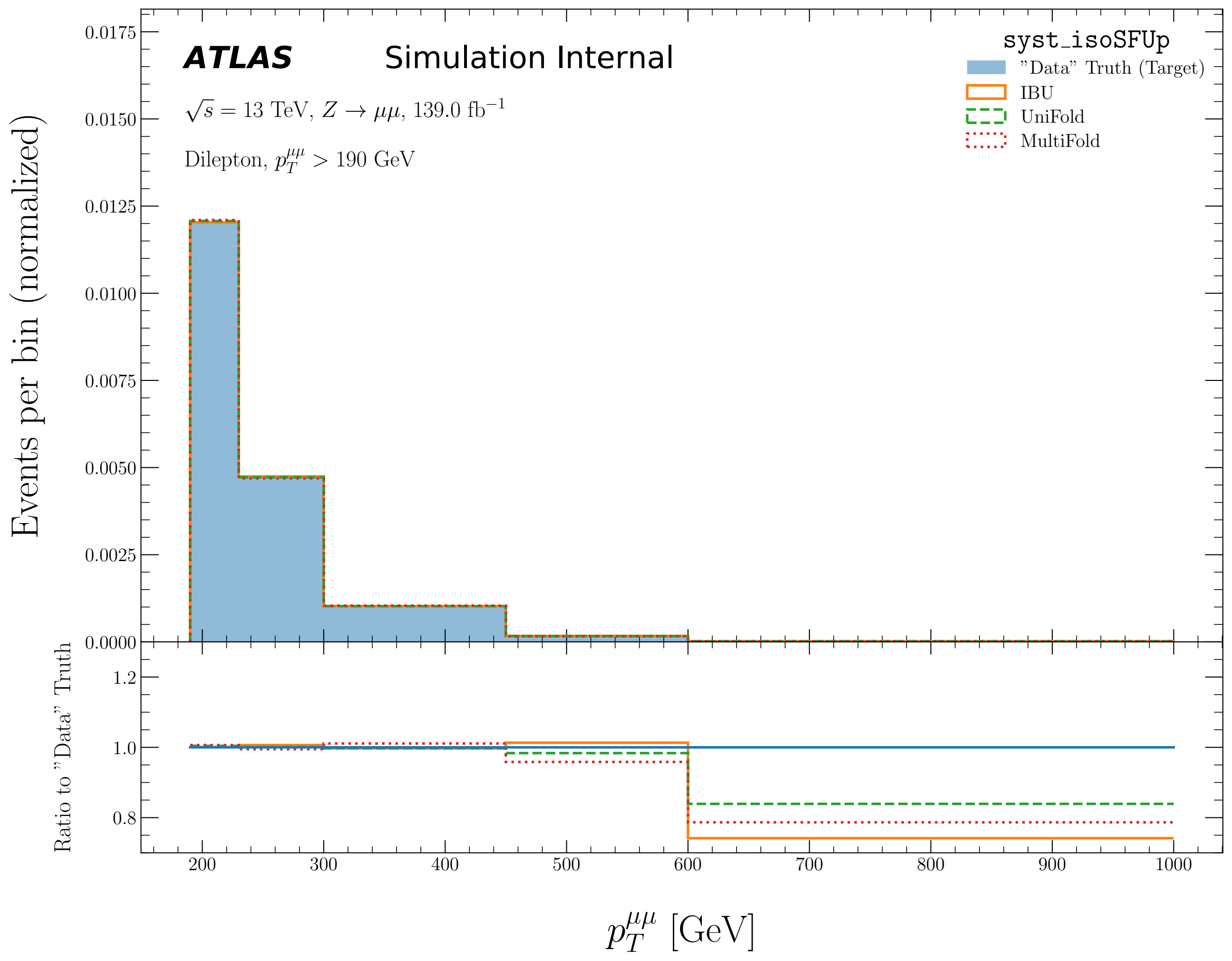


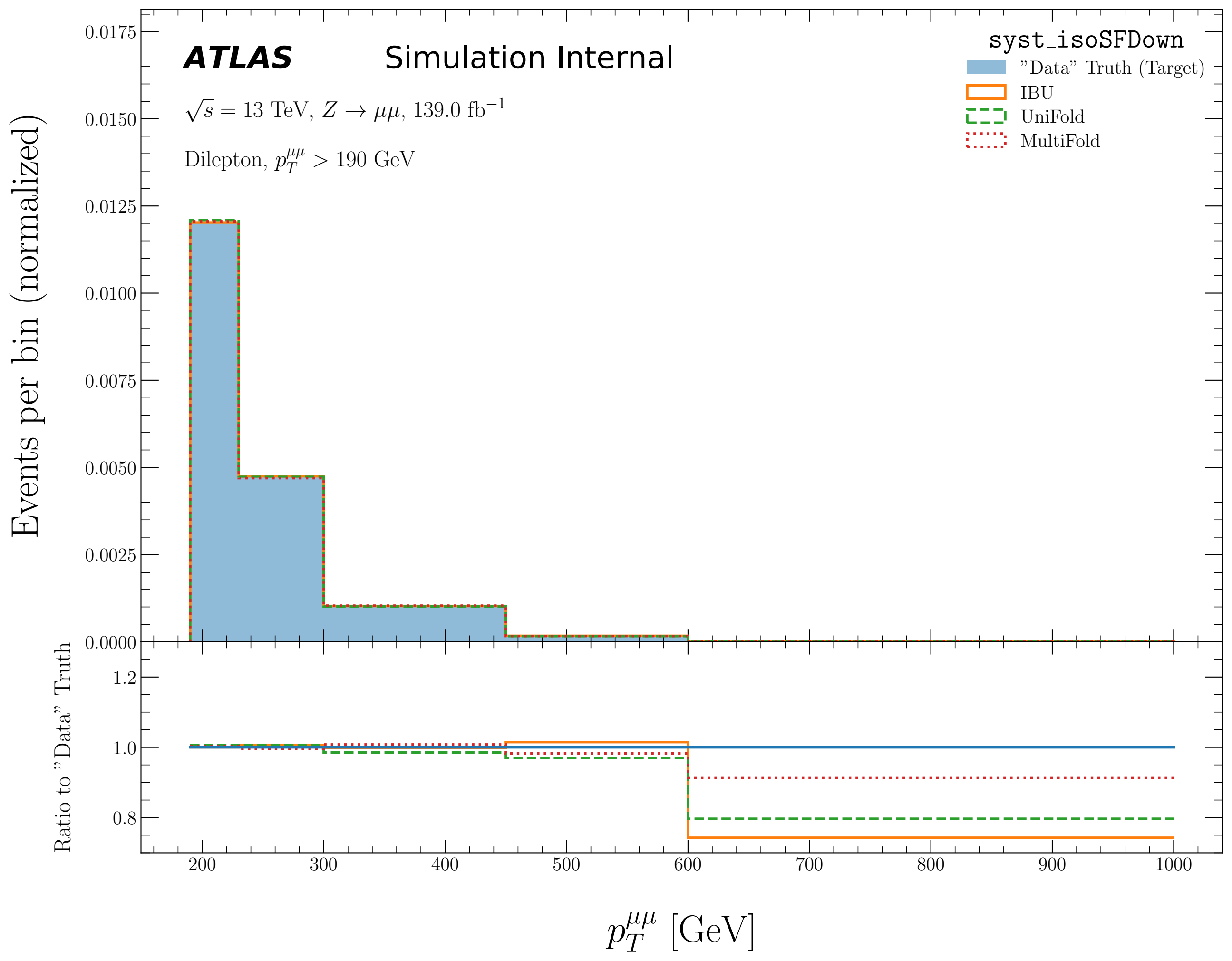


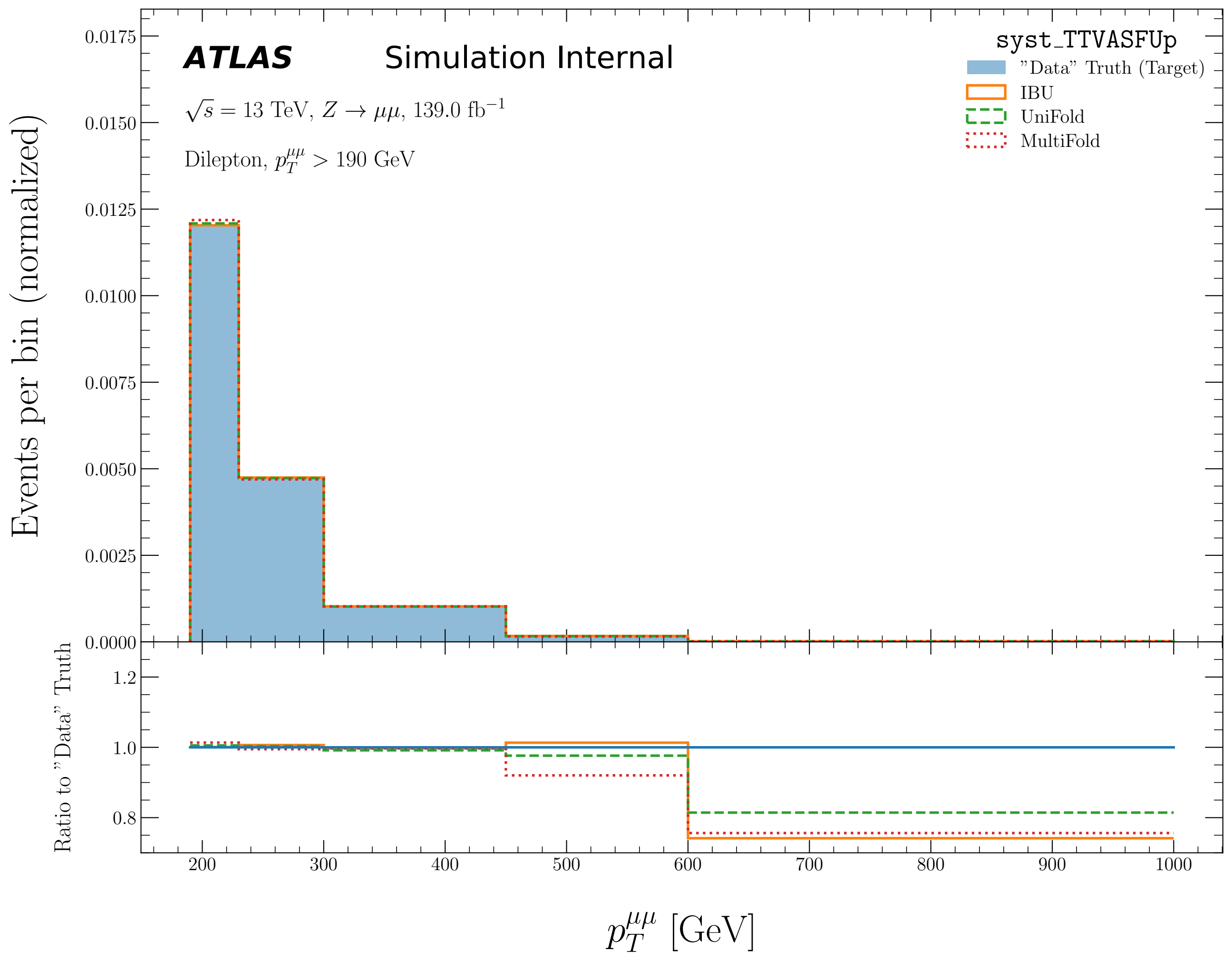


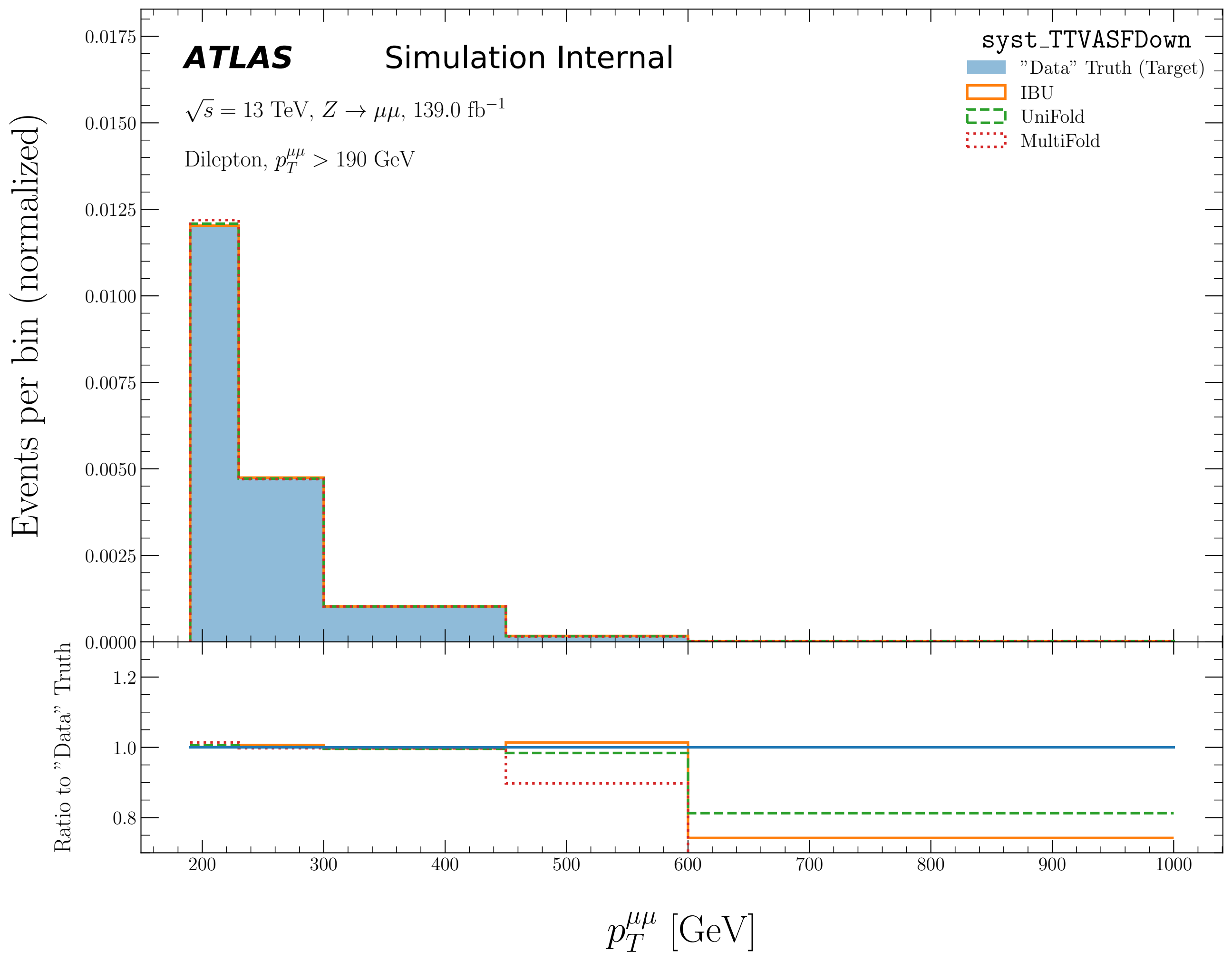




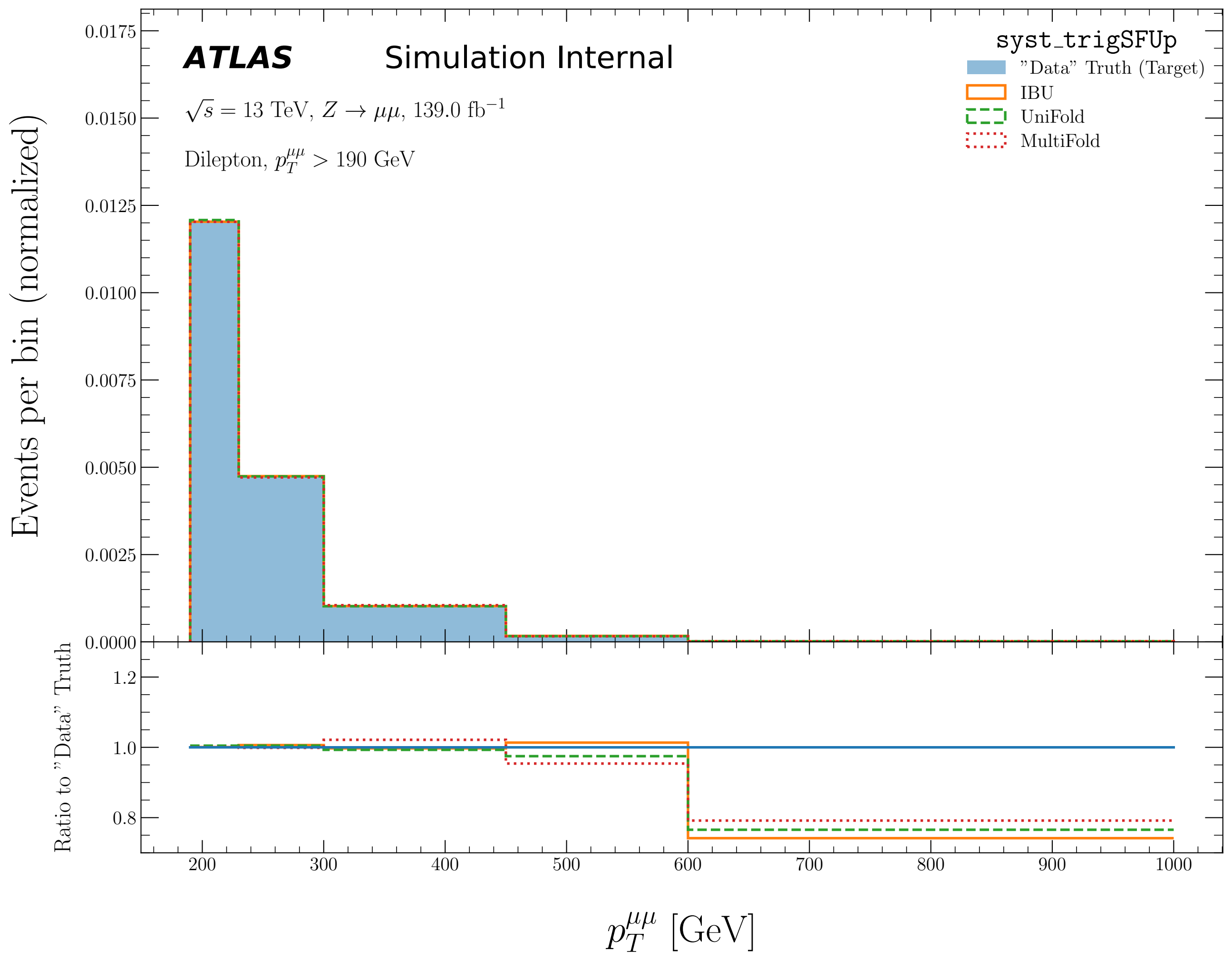


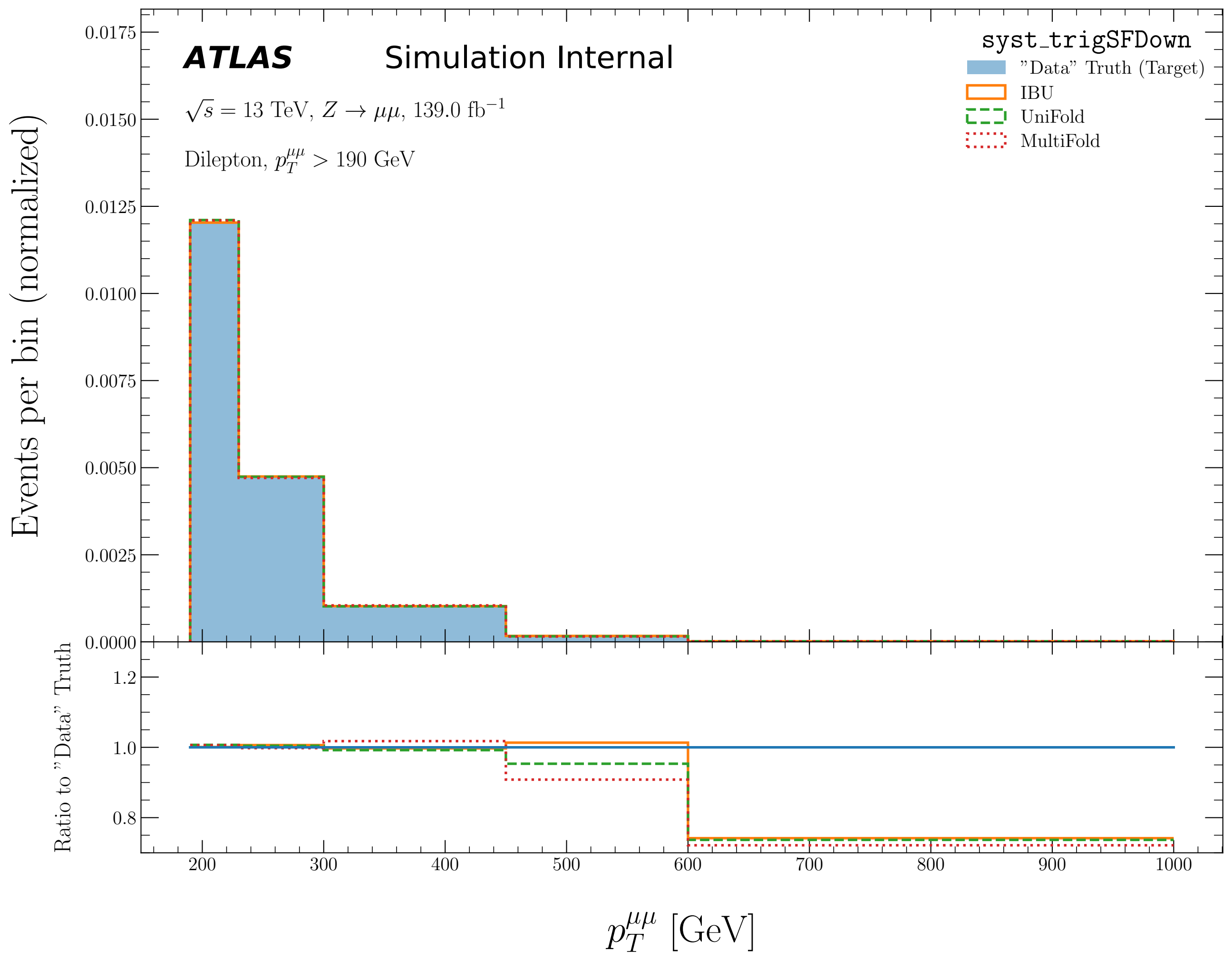


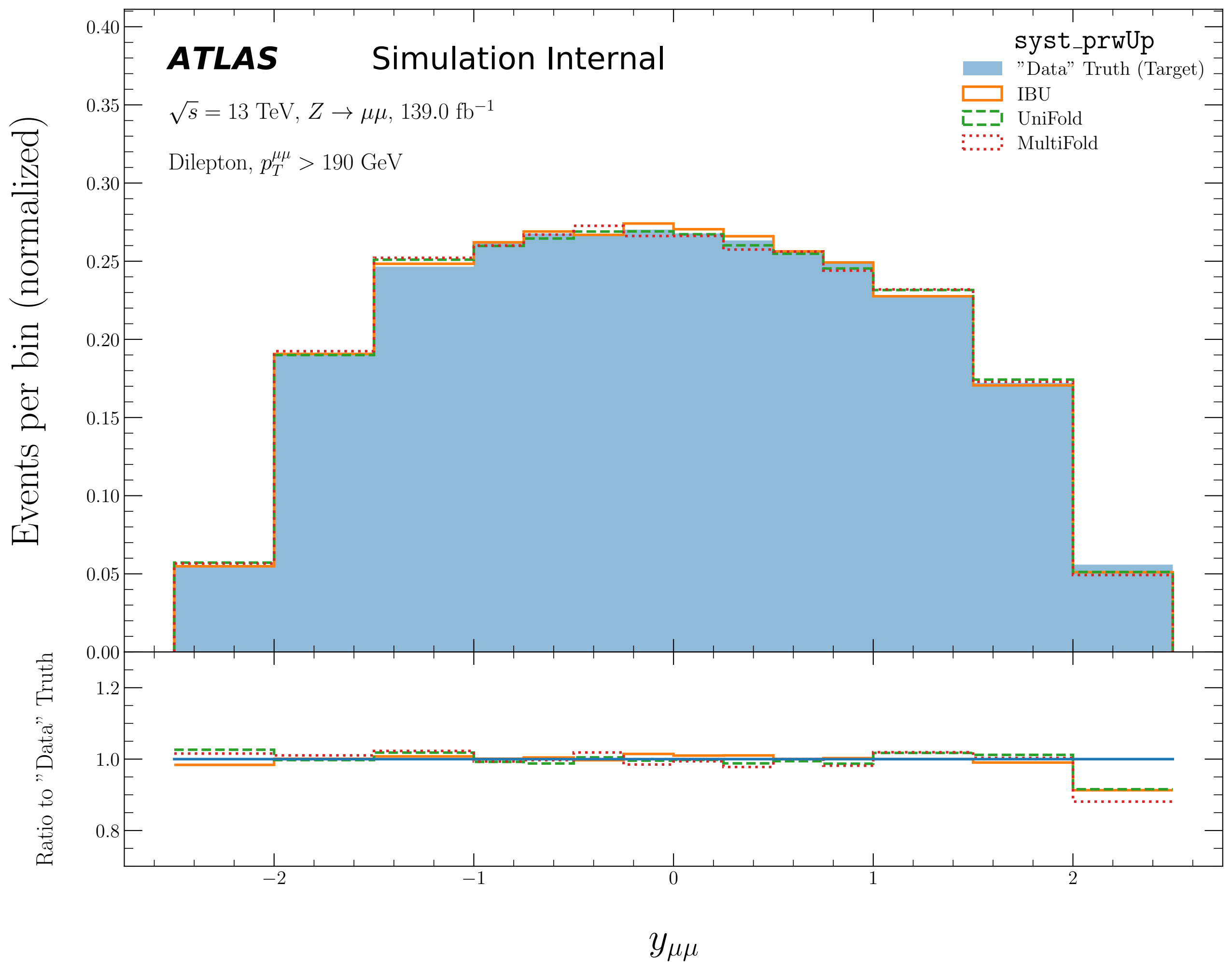












Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

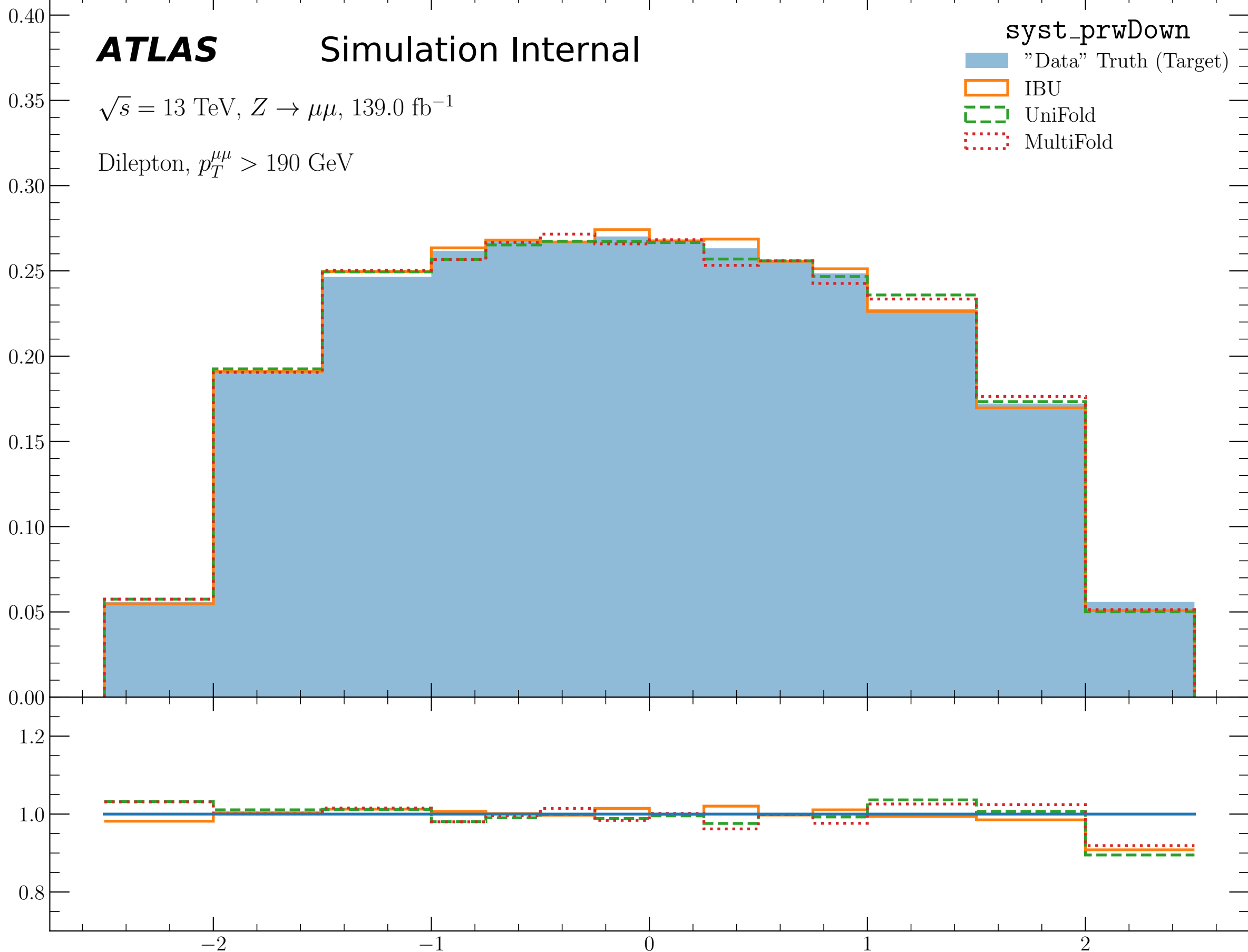
Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

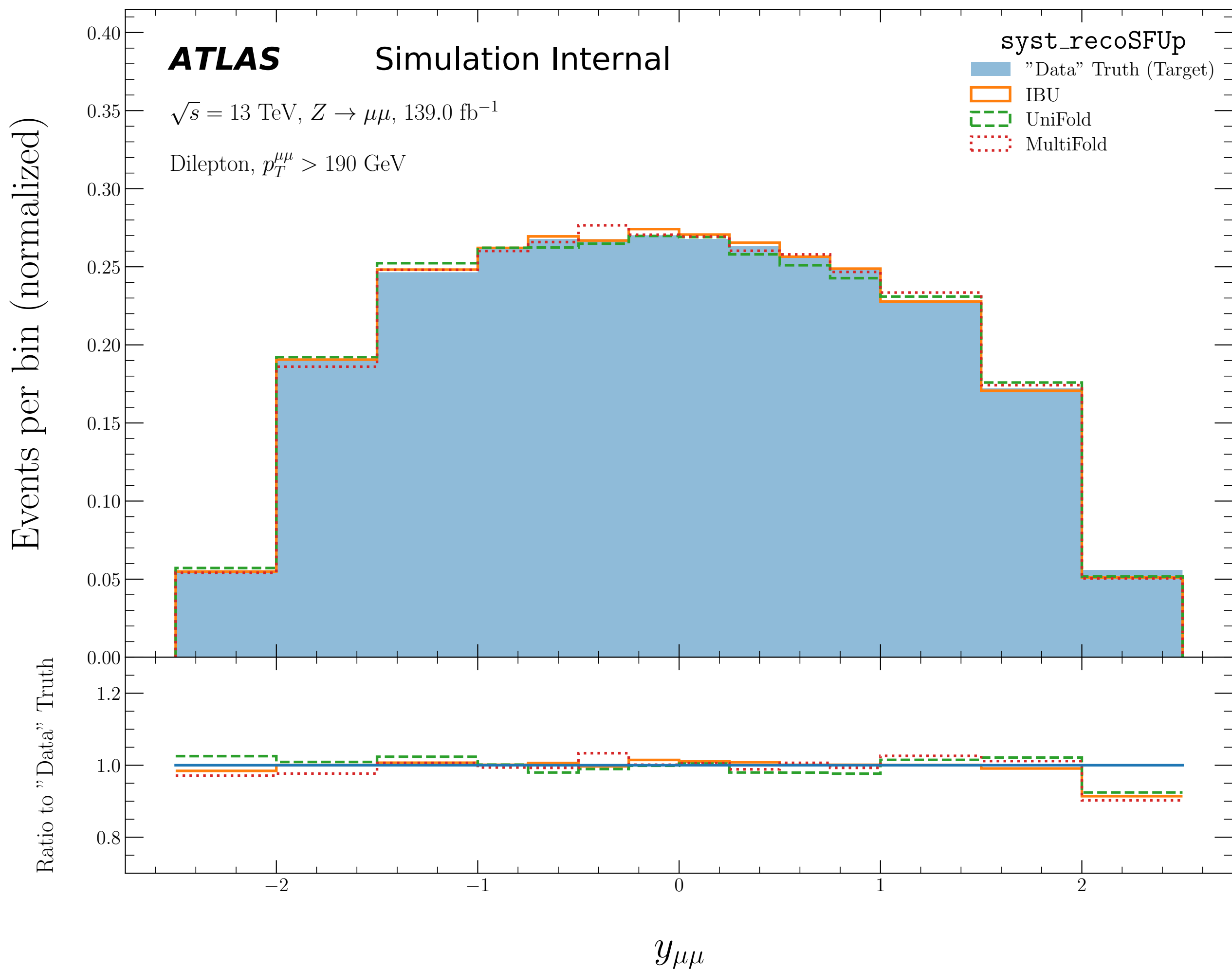
syst\_prwDown

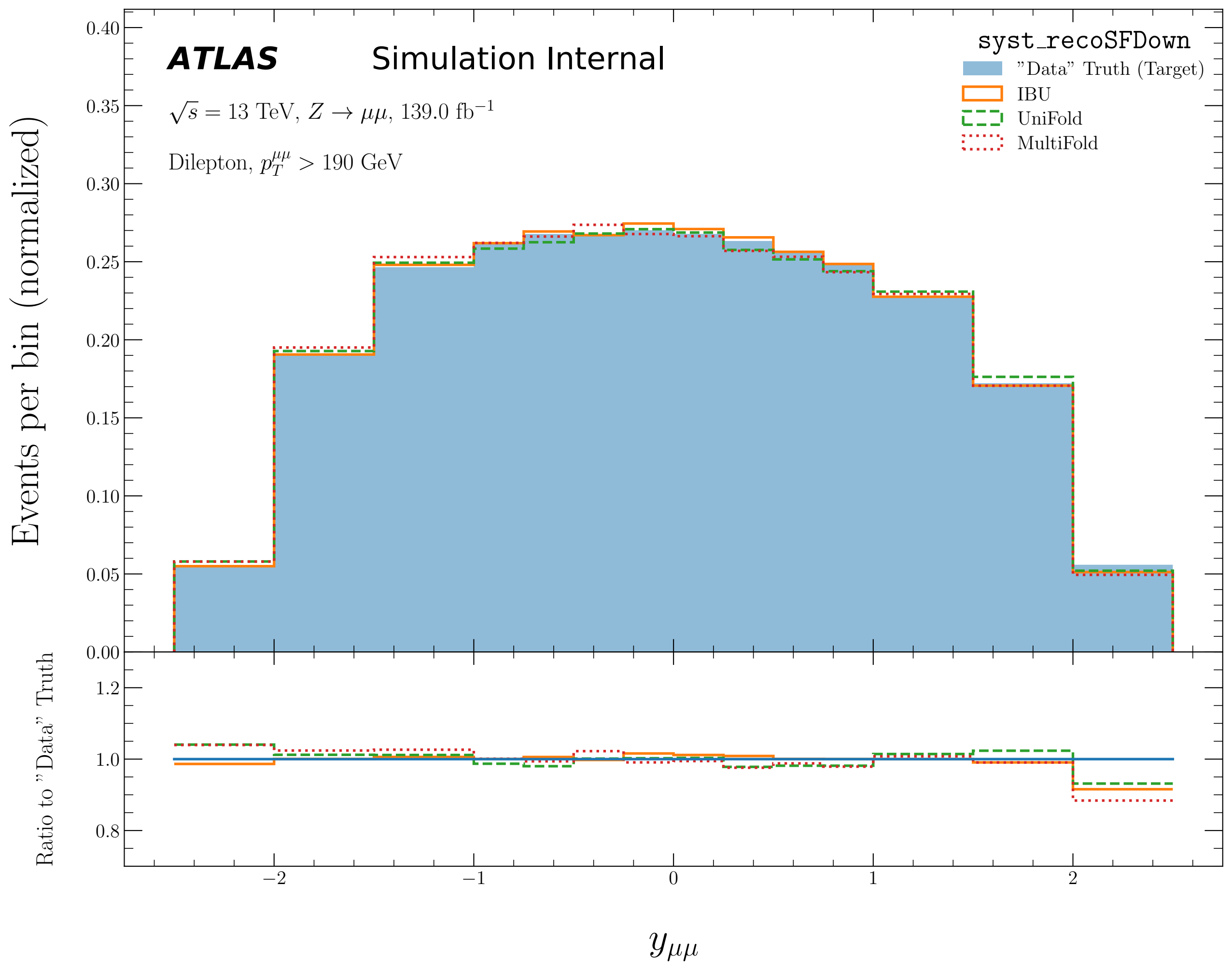
- "Data" Truth (Target)
- IBU
- UniFold
- MultiFold

Ratio to "Data" Truth

$y_{\mu\mu}$







Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

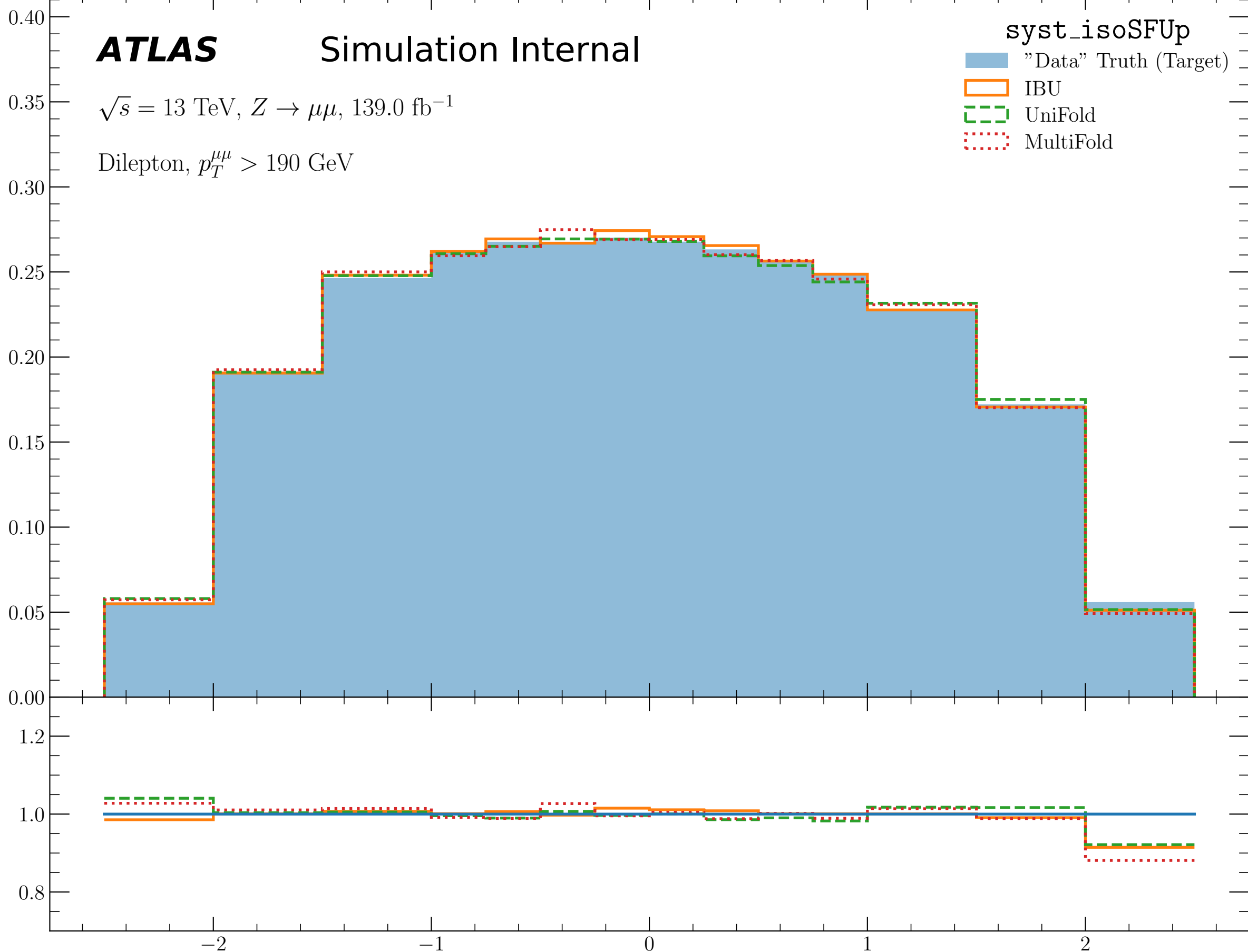
Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

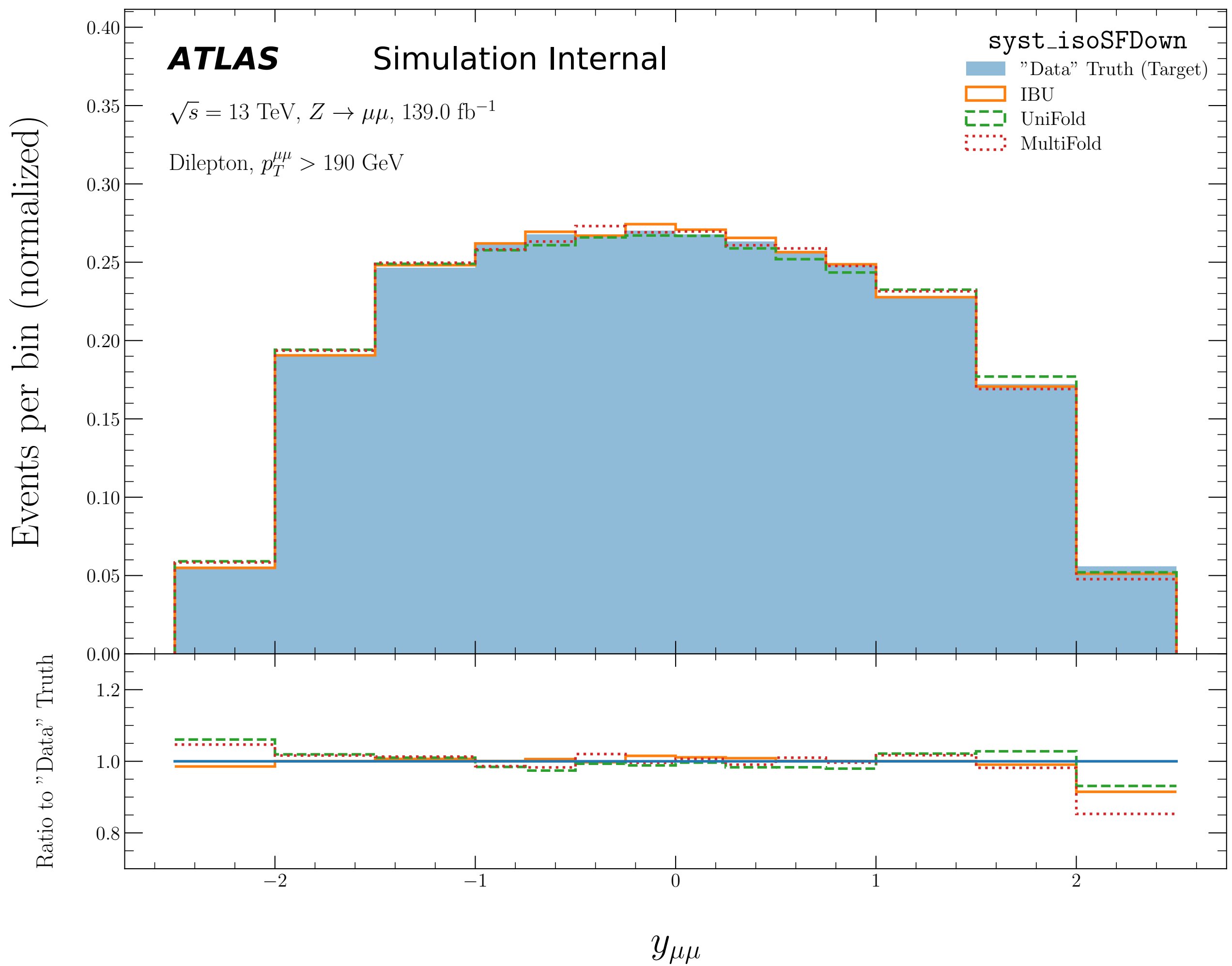
**syst\_isoSFUp**

- "Data" Truth (Target)
- IBU
- UniFold
- MultiFold

Ratio to "Data" Truth

$y_{\mu\mu}$







Events per bin (normalized)

**ATLAS**

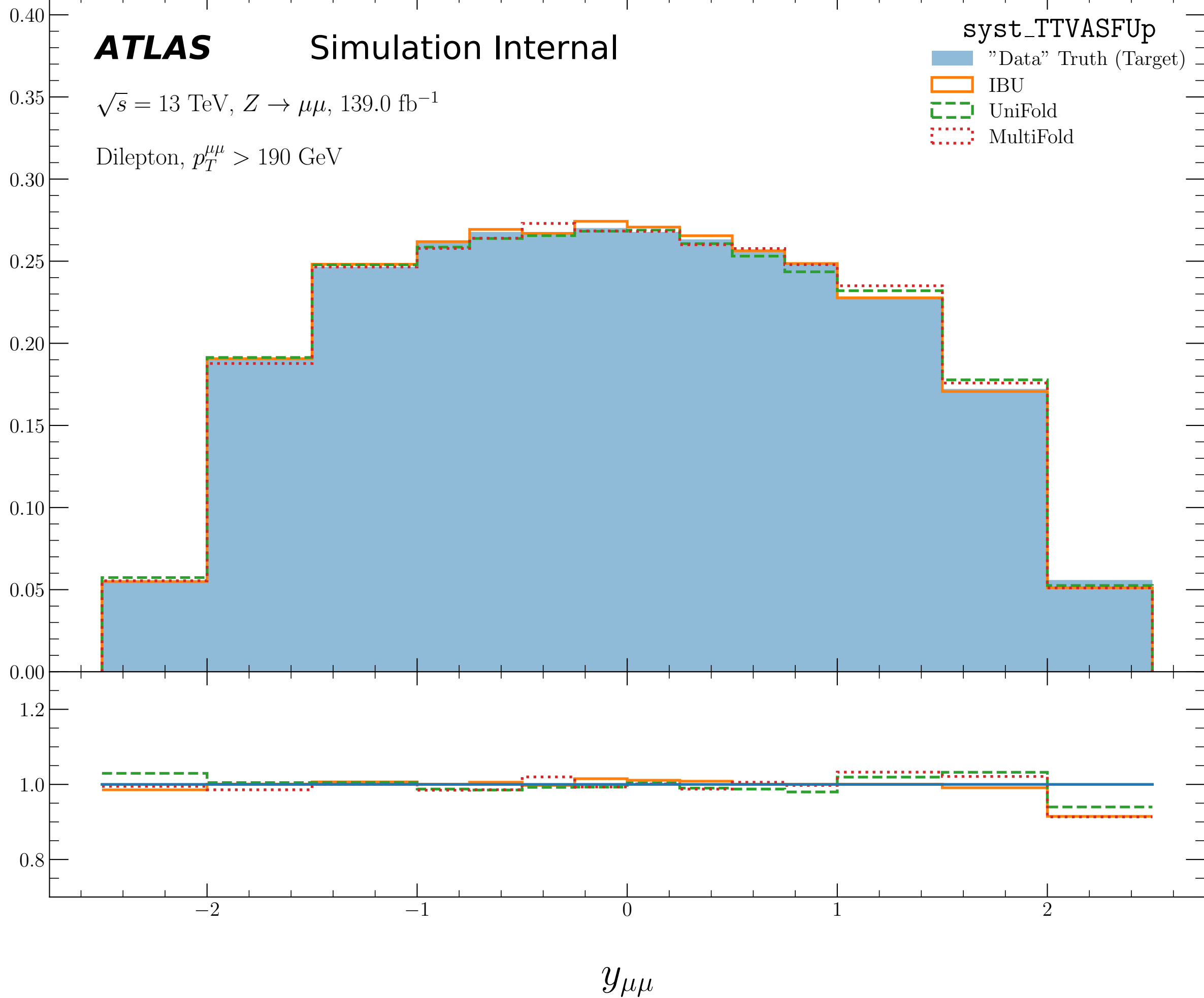
Simulation Internal

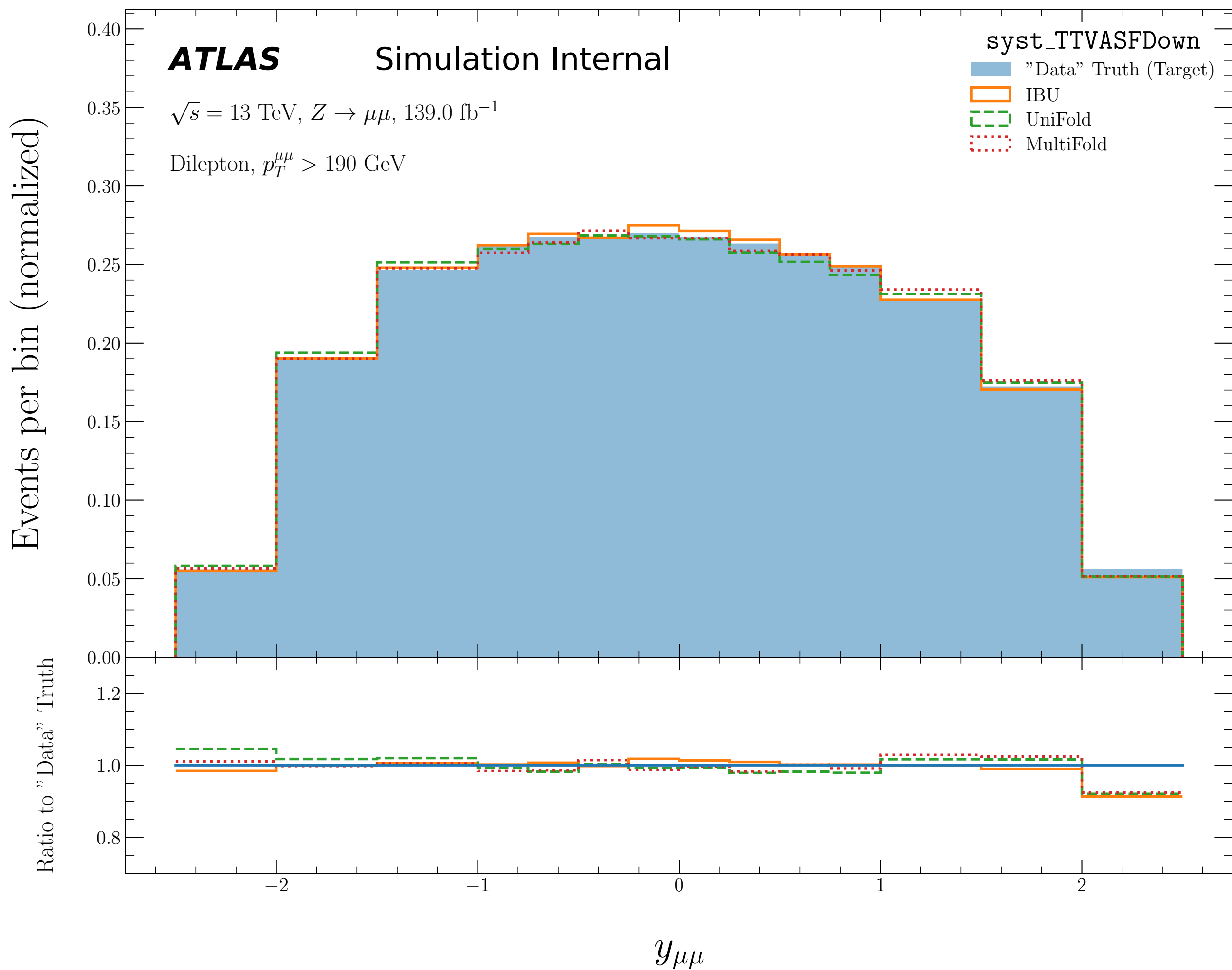
$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

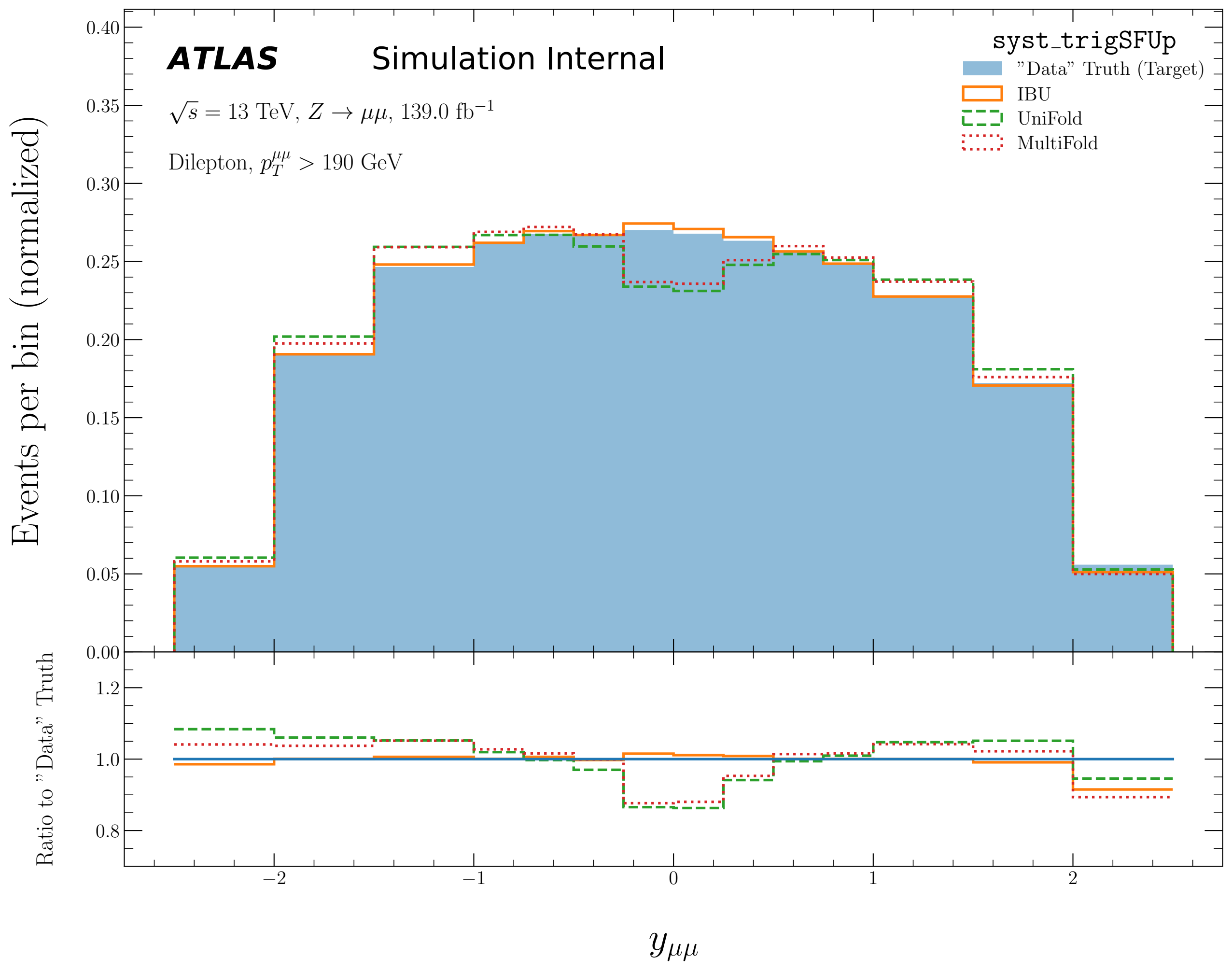
Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_TTVASFUp

- "Data" Truth (Target)
- IBU
- UniFold
- MultiFold







Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_trigSFDown

"Data" Truth (Target)

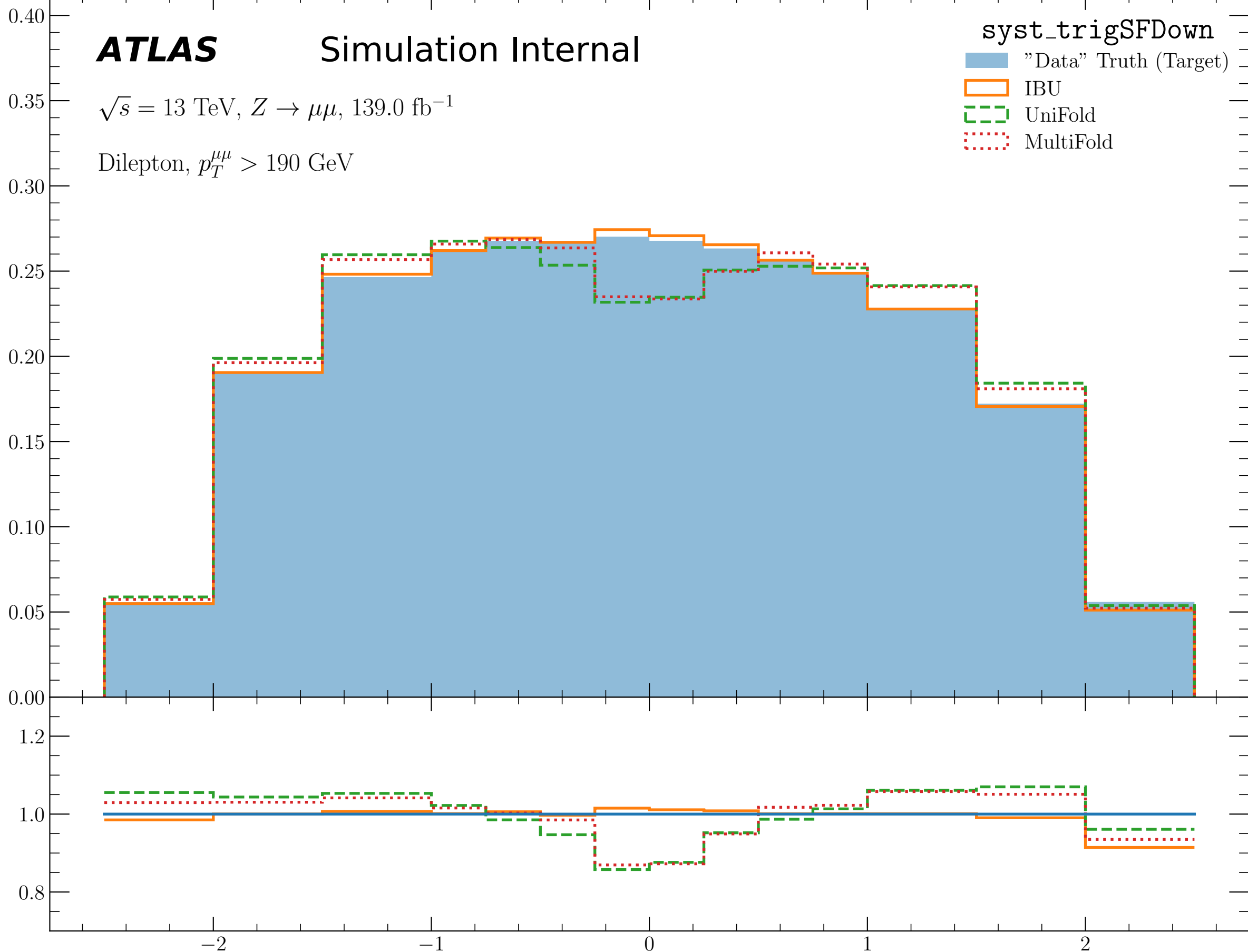
IBU

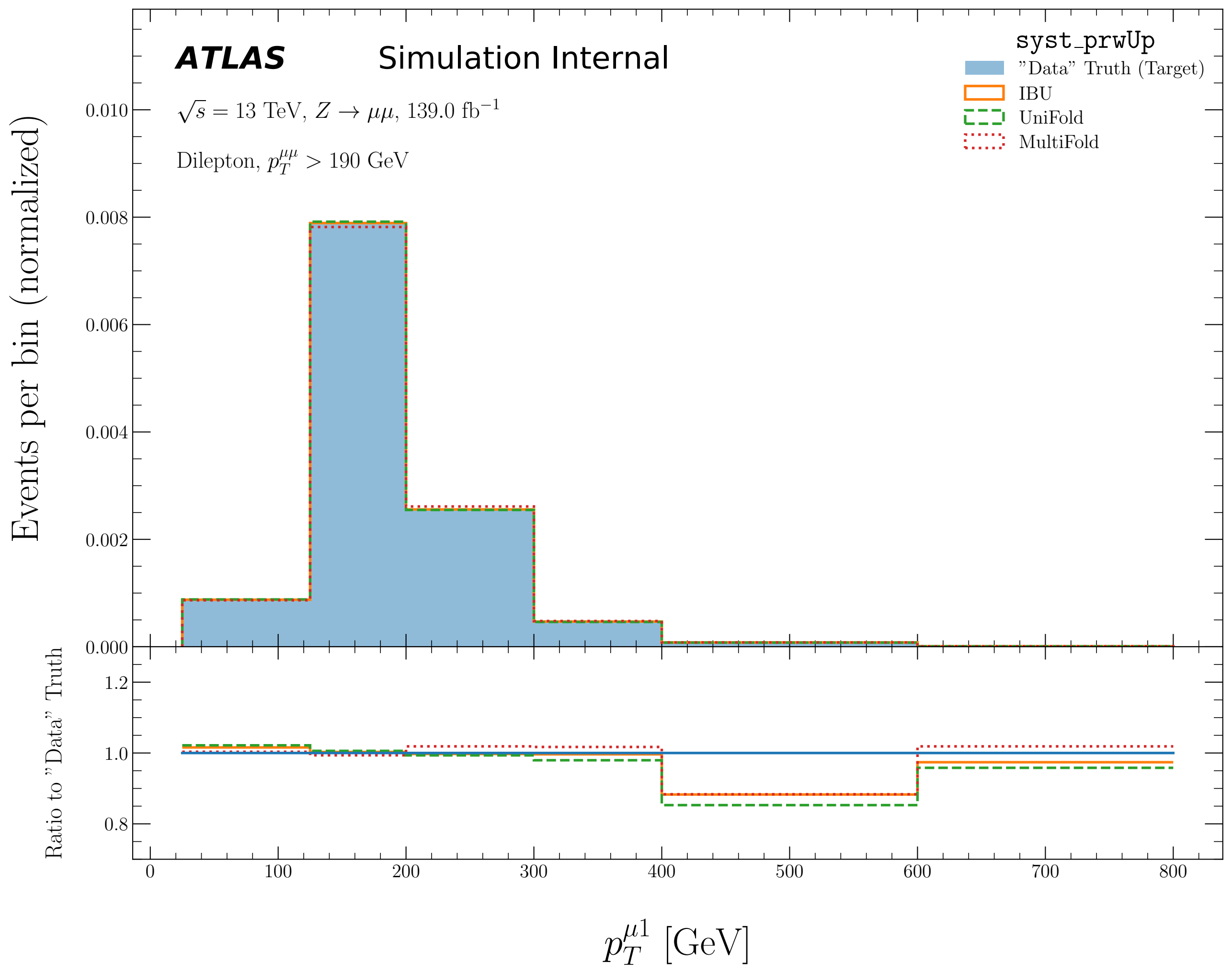
UniFold

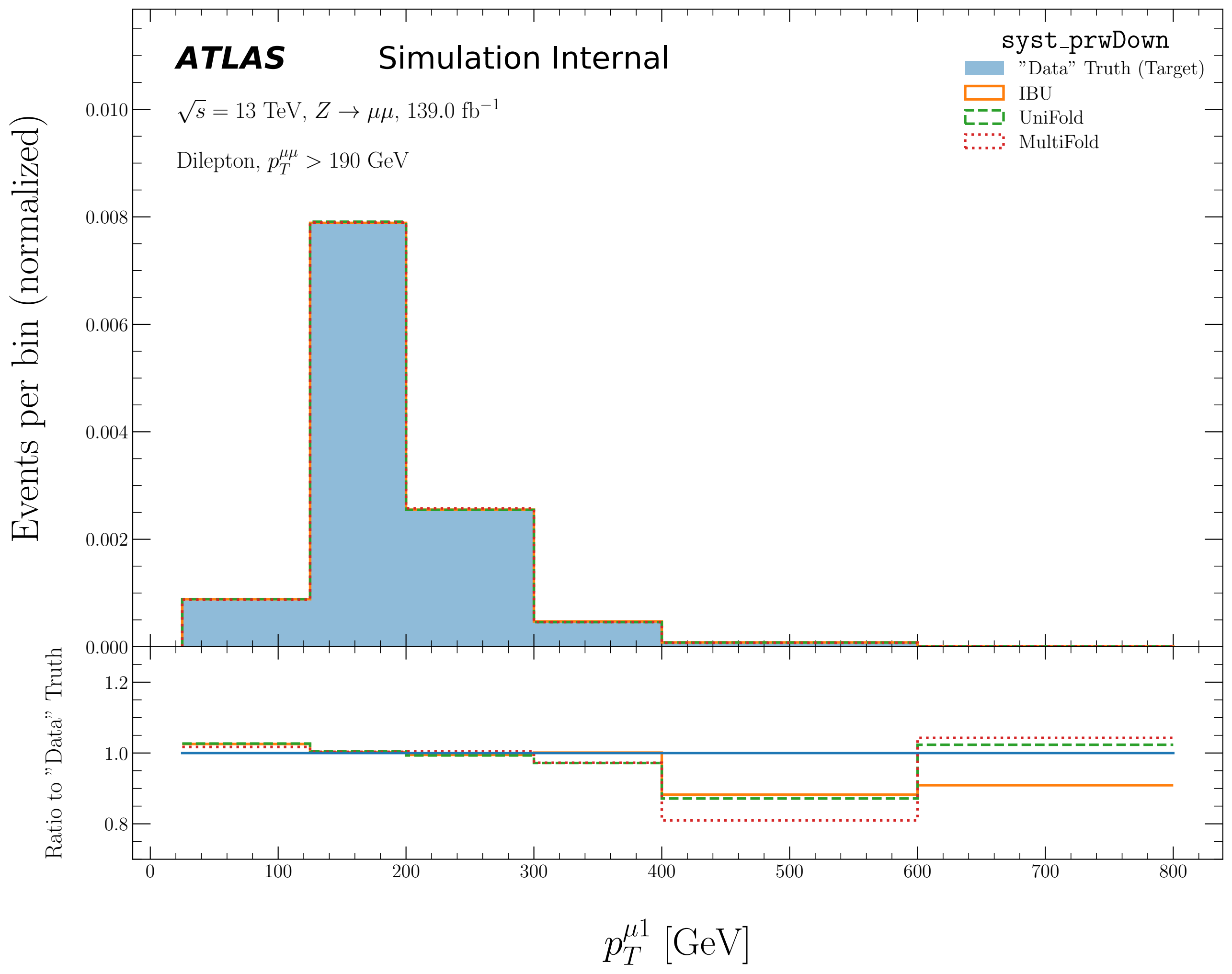
MultiFold

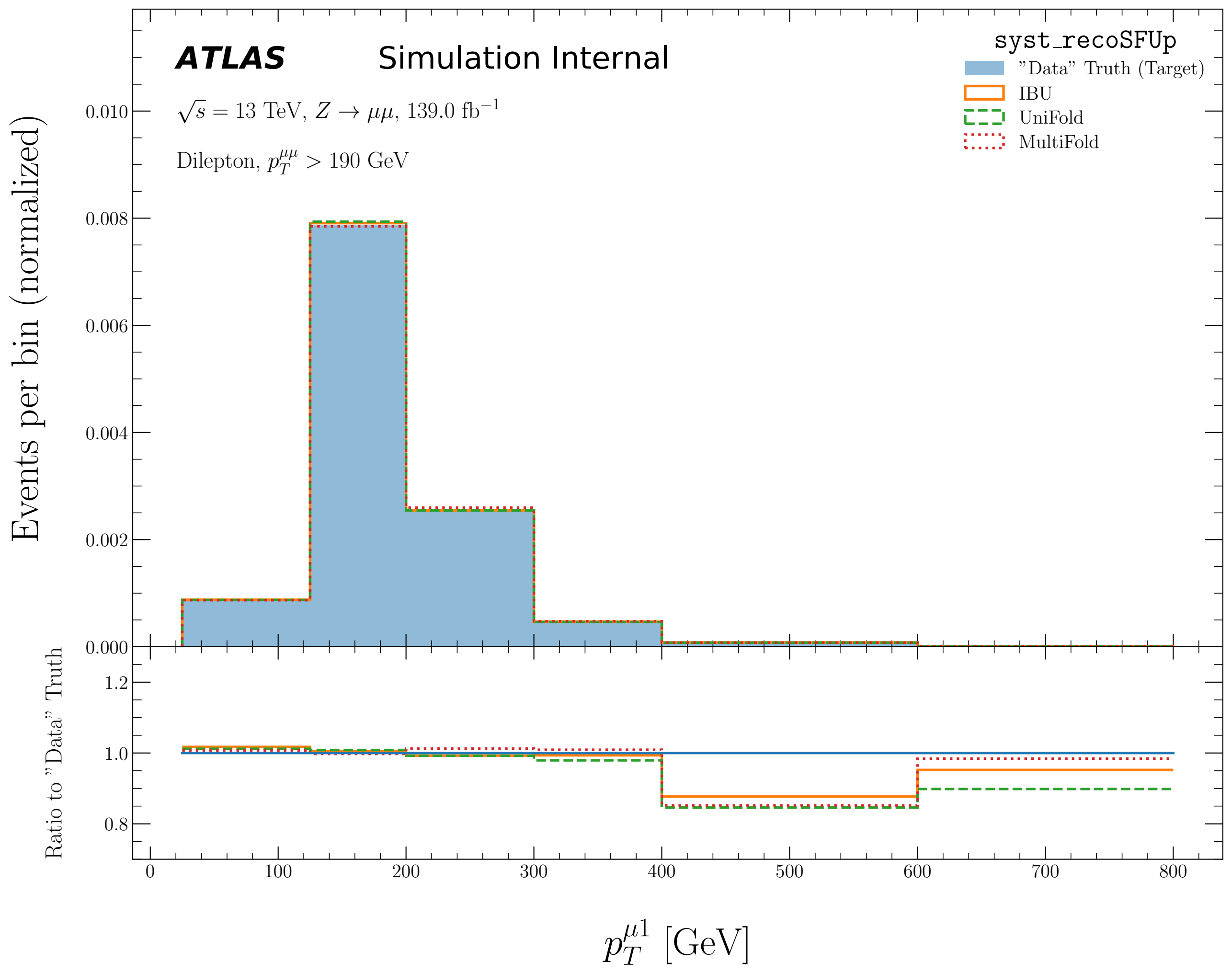
Ratio to "Data" Truth

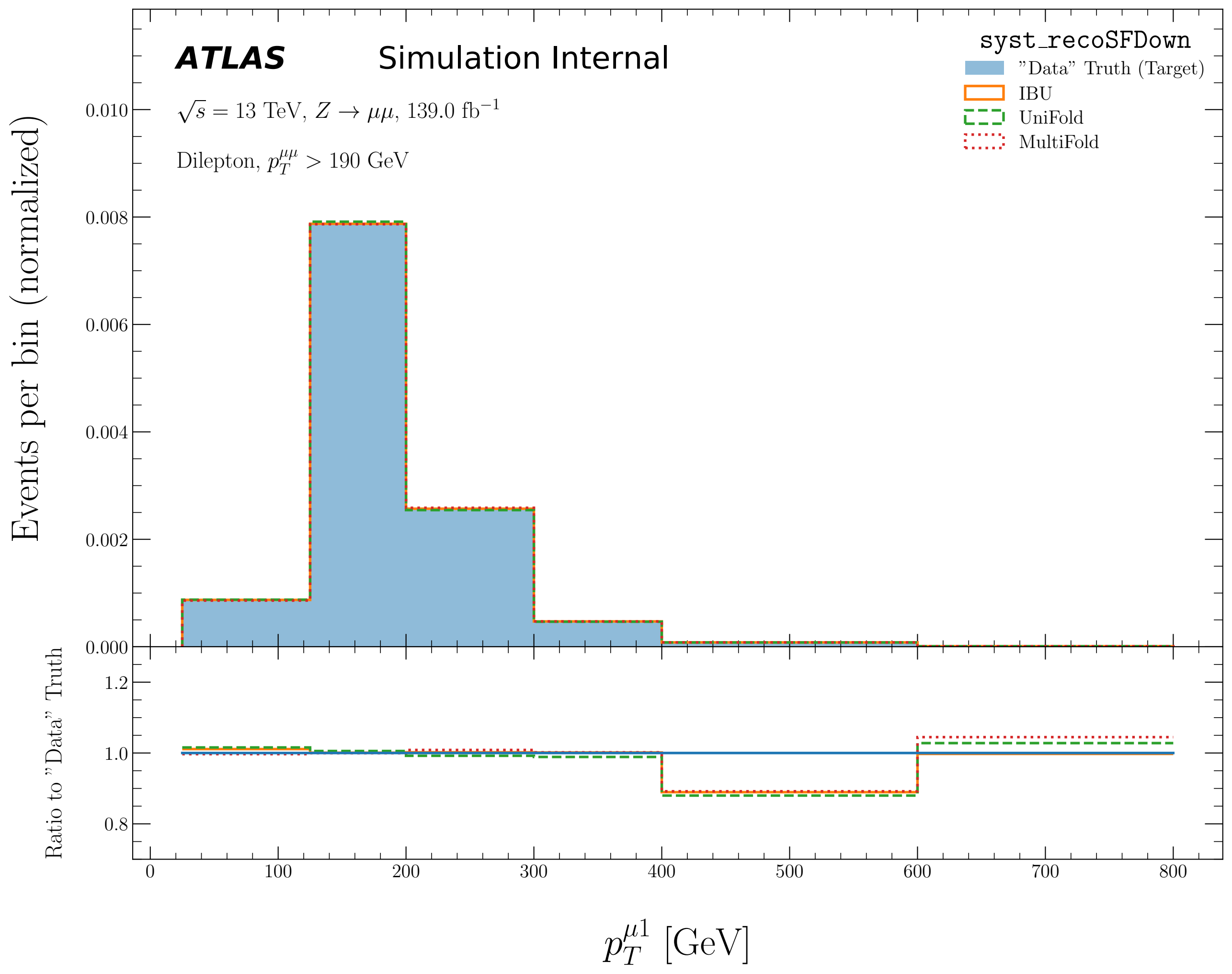
$y_{\mu\mu}$



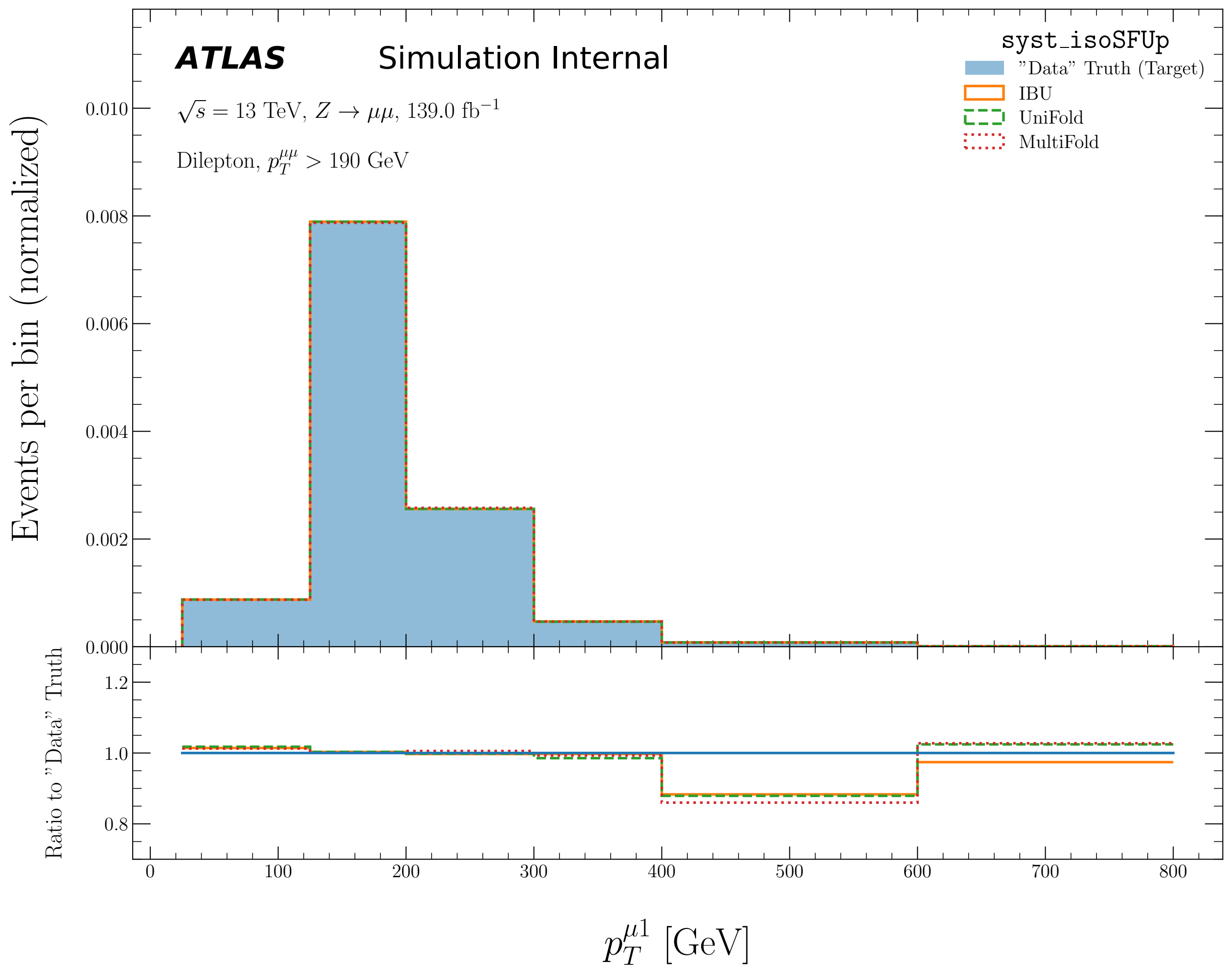


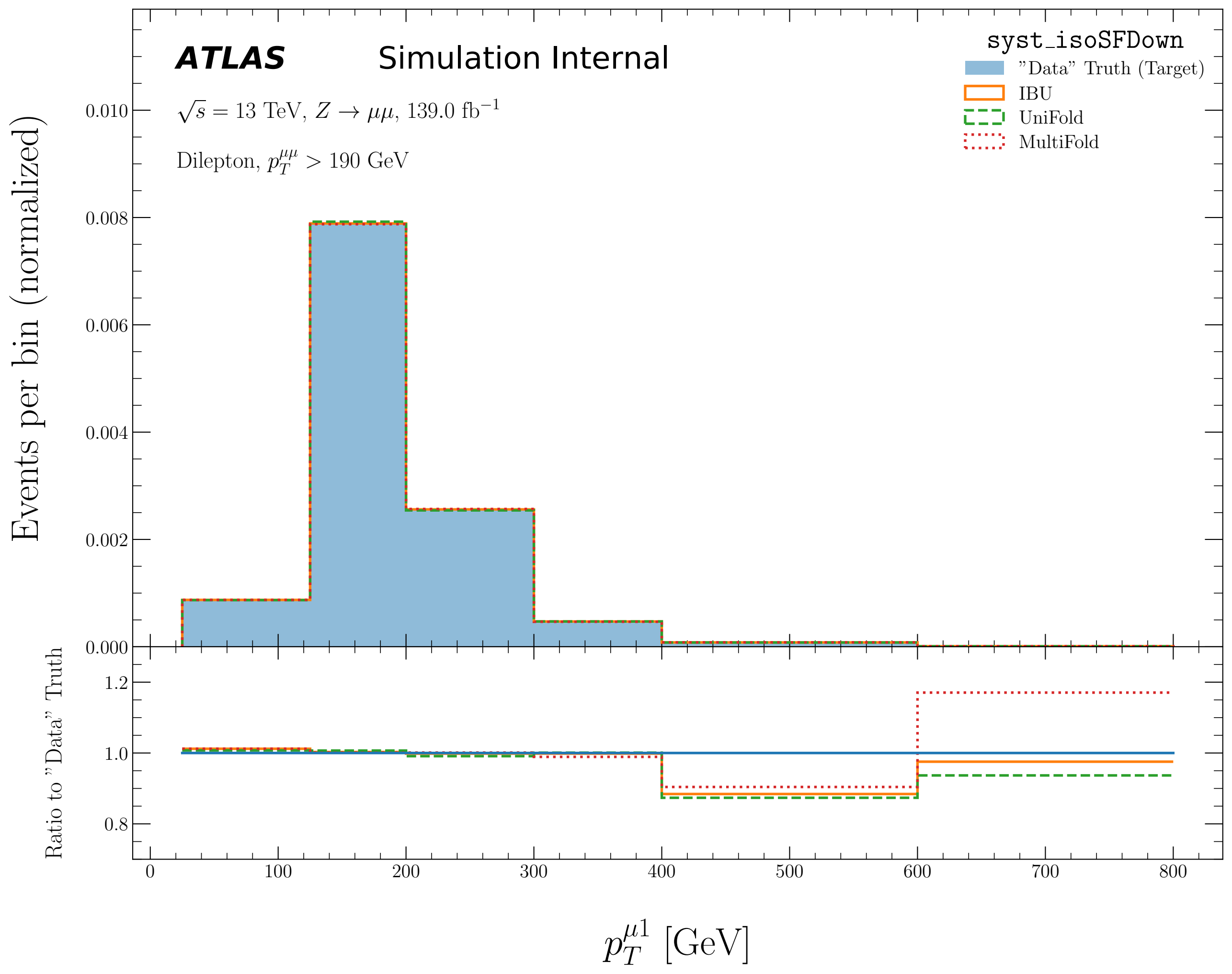


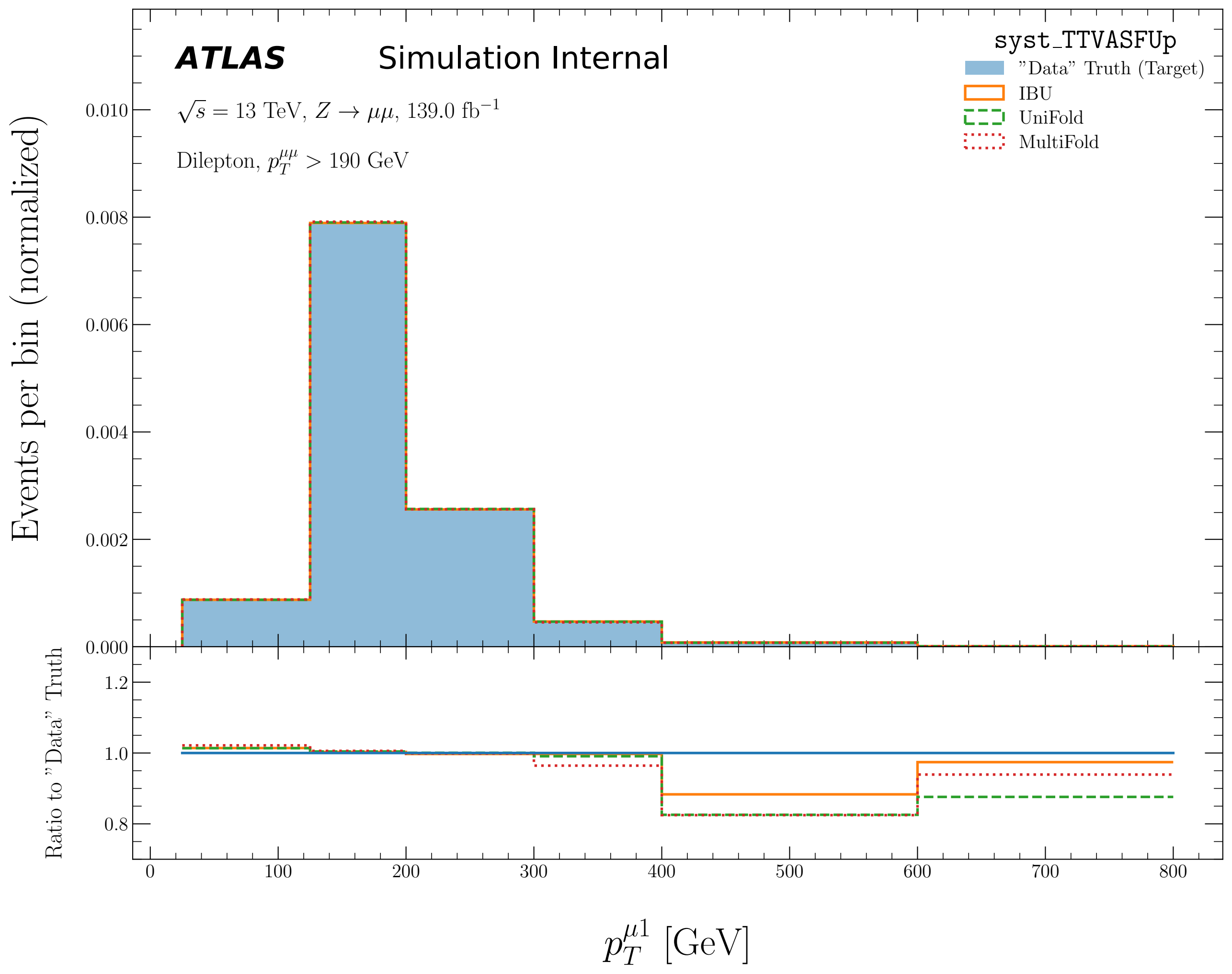


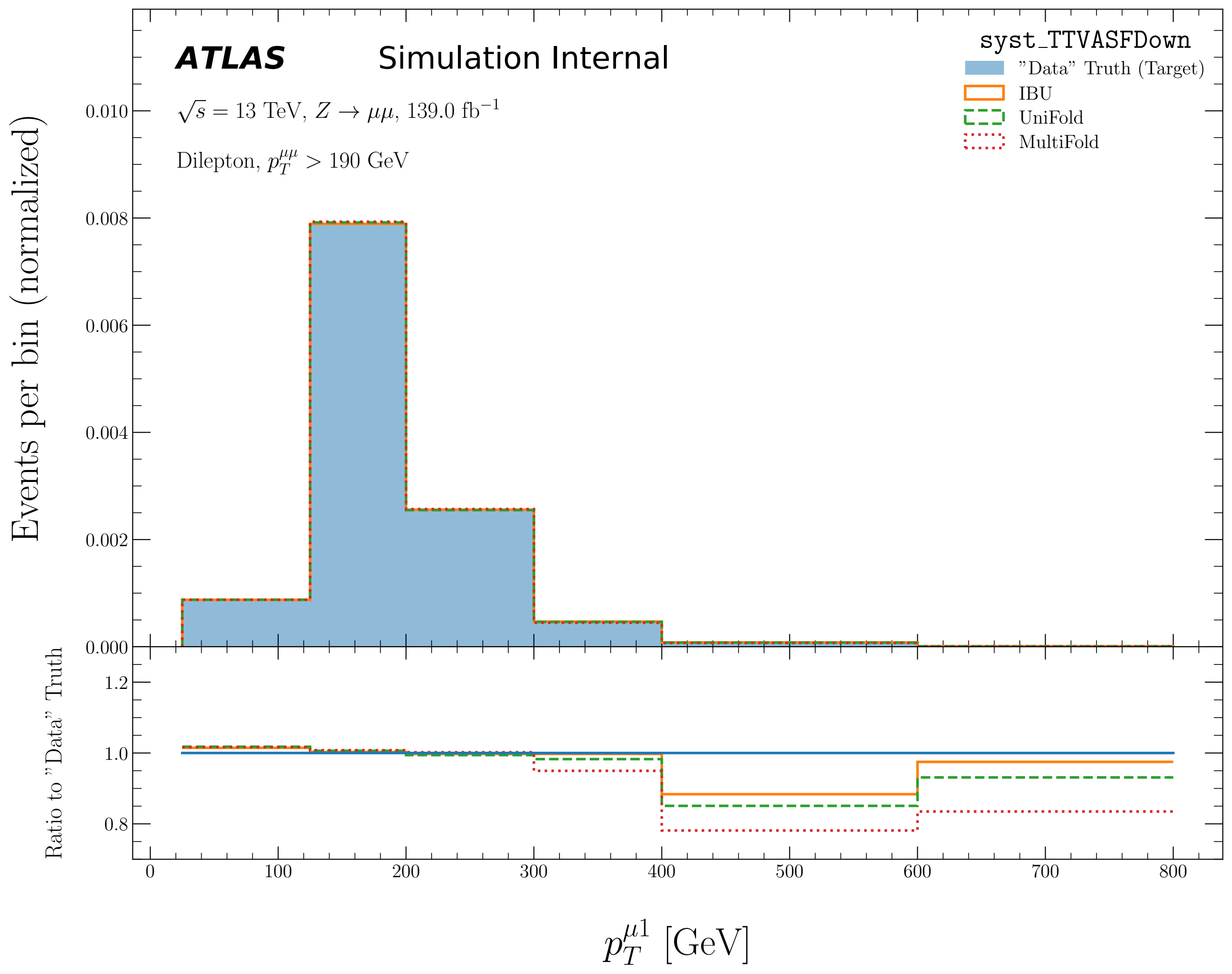


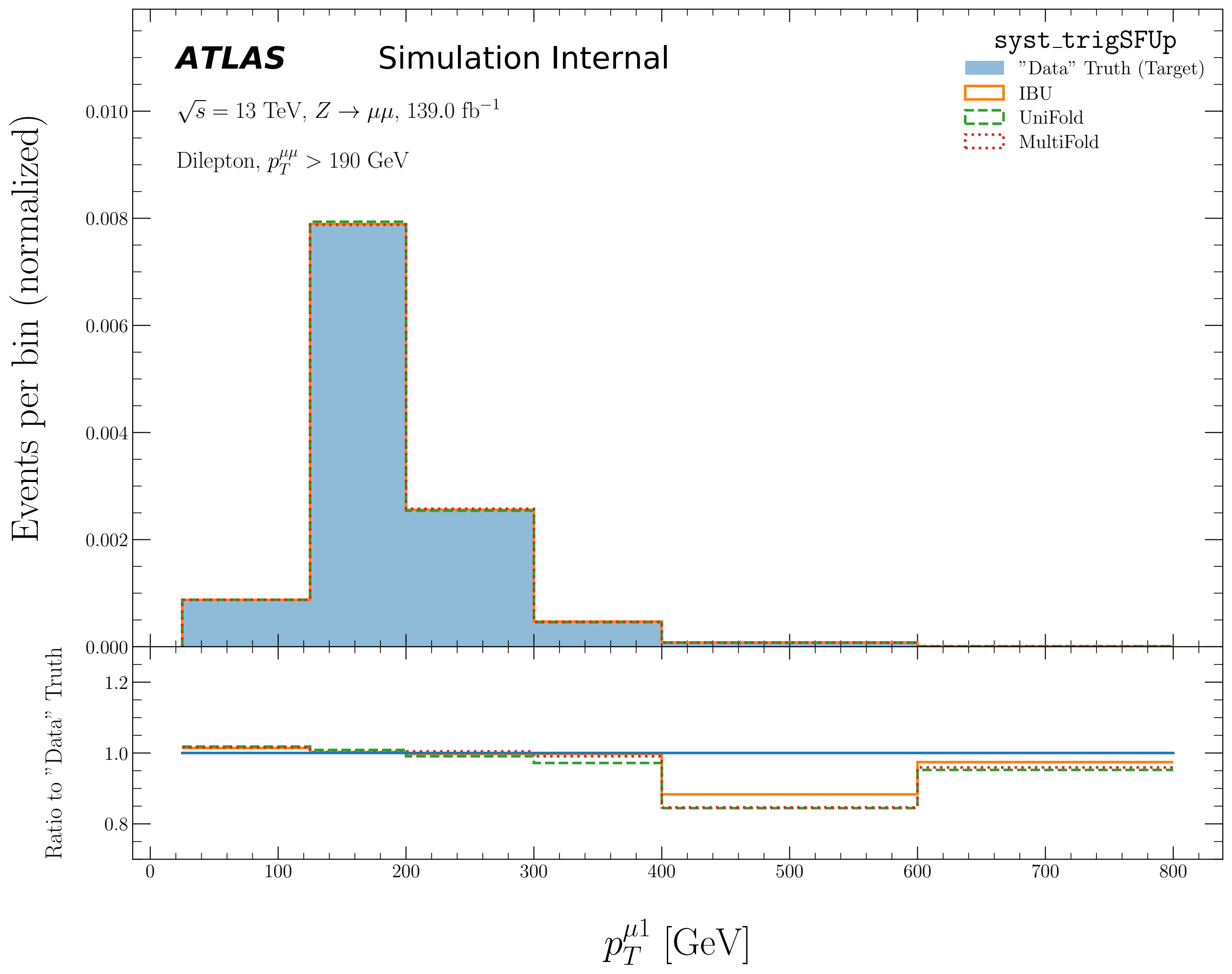


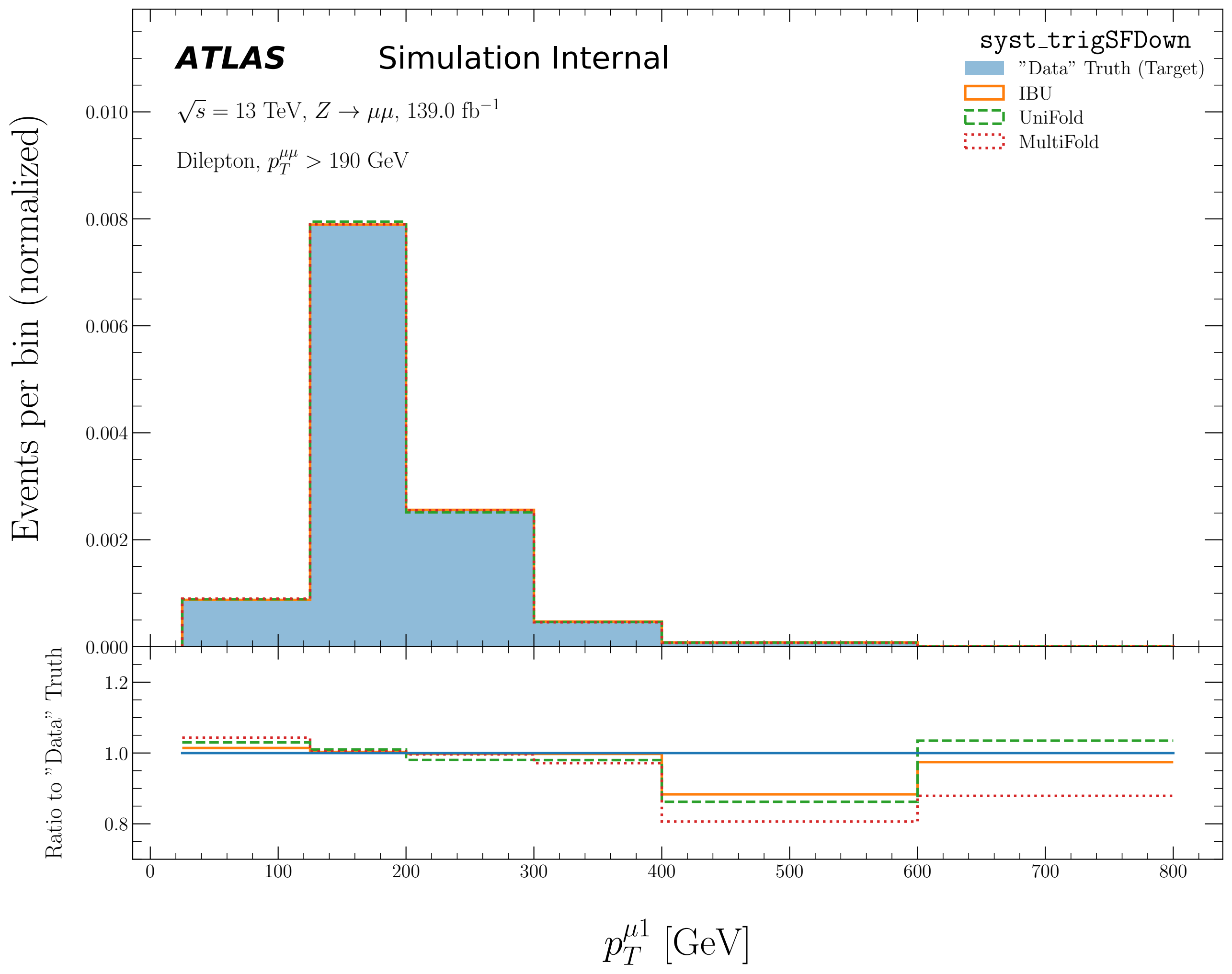


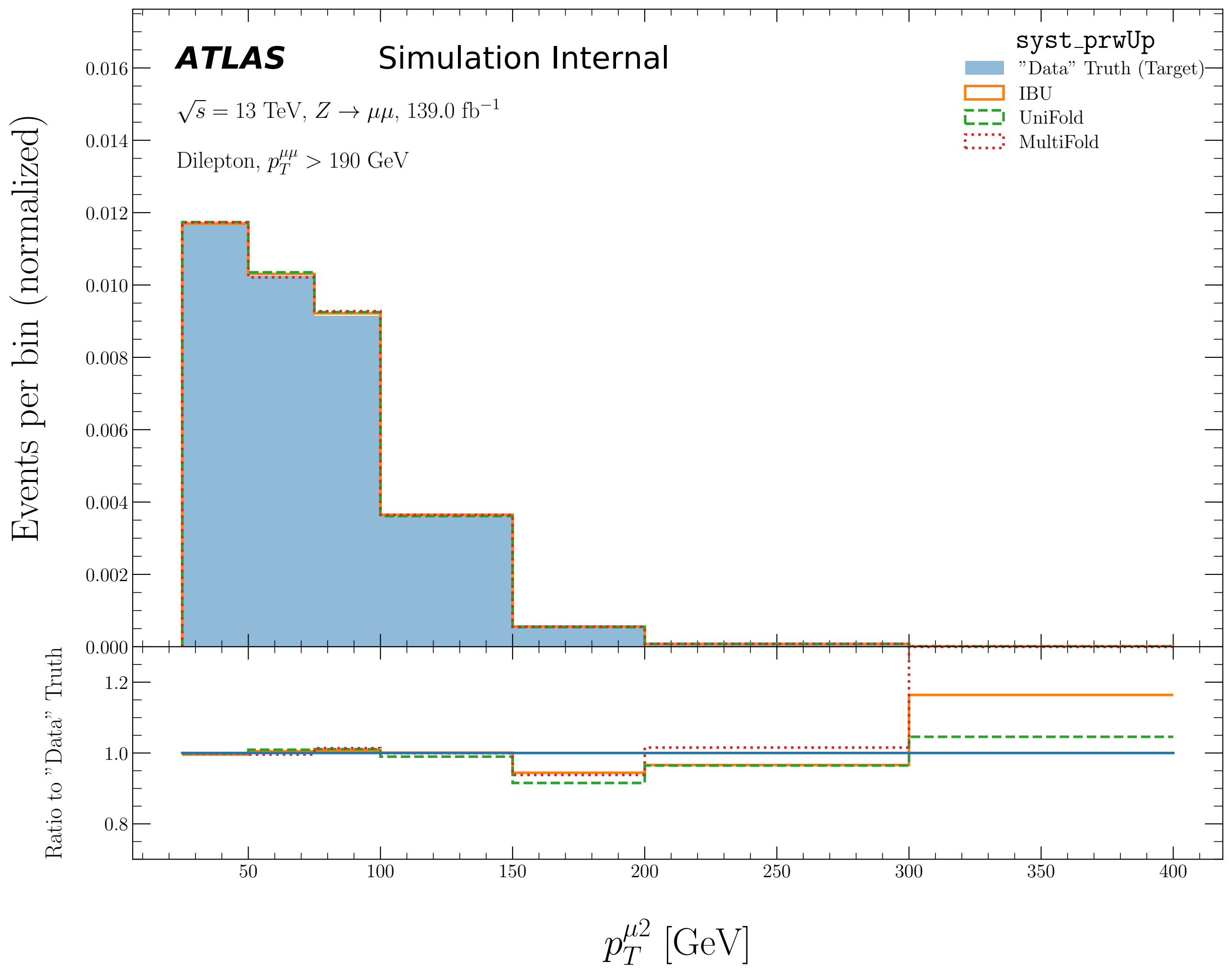


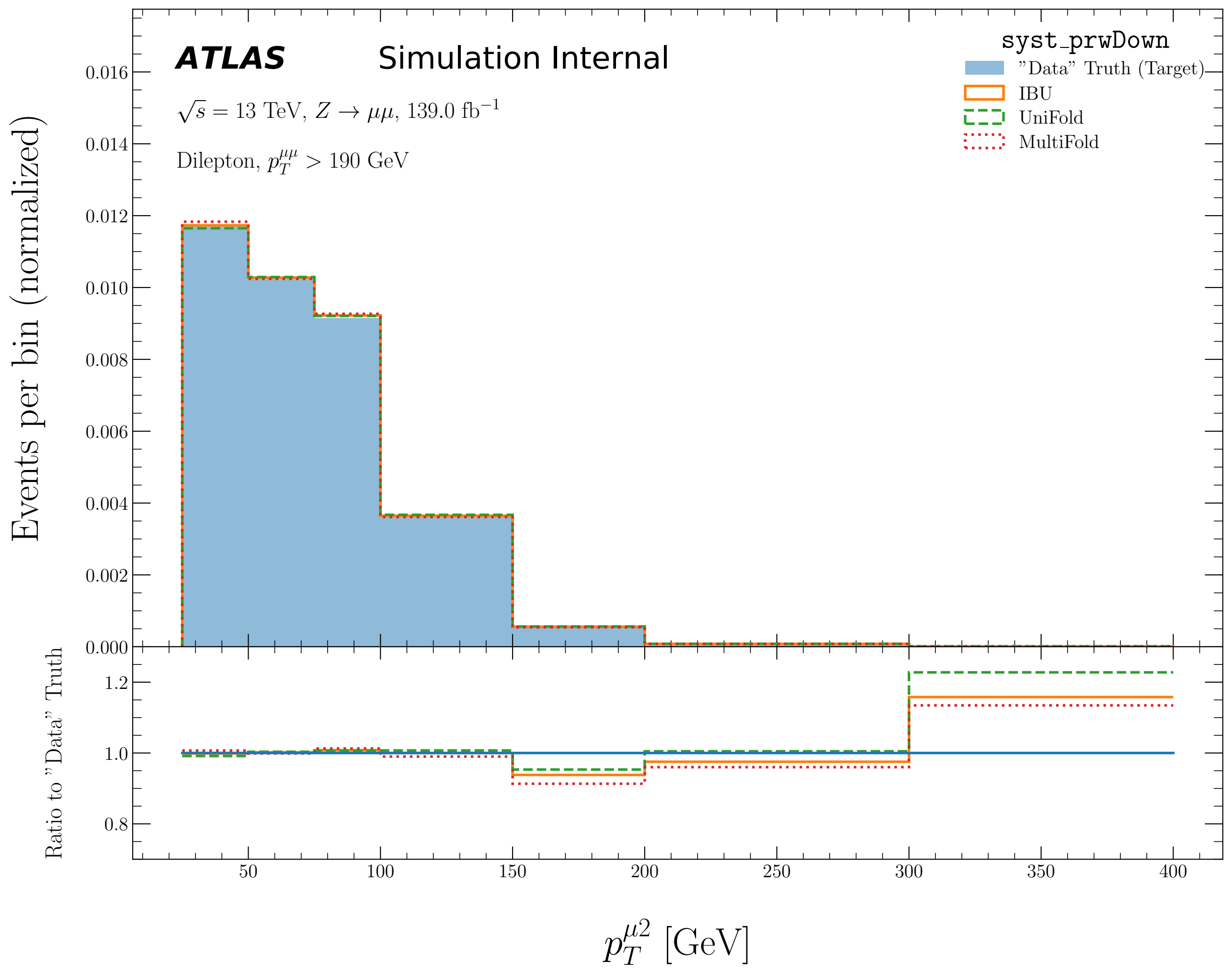




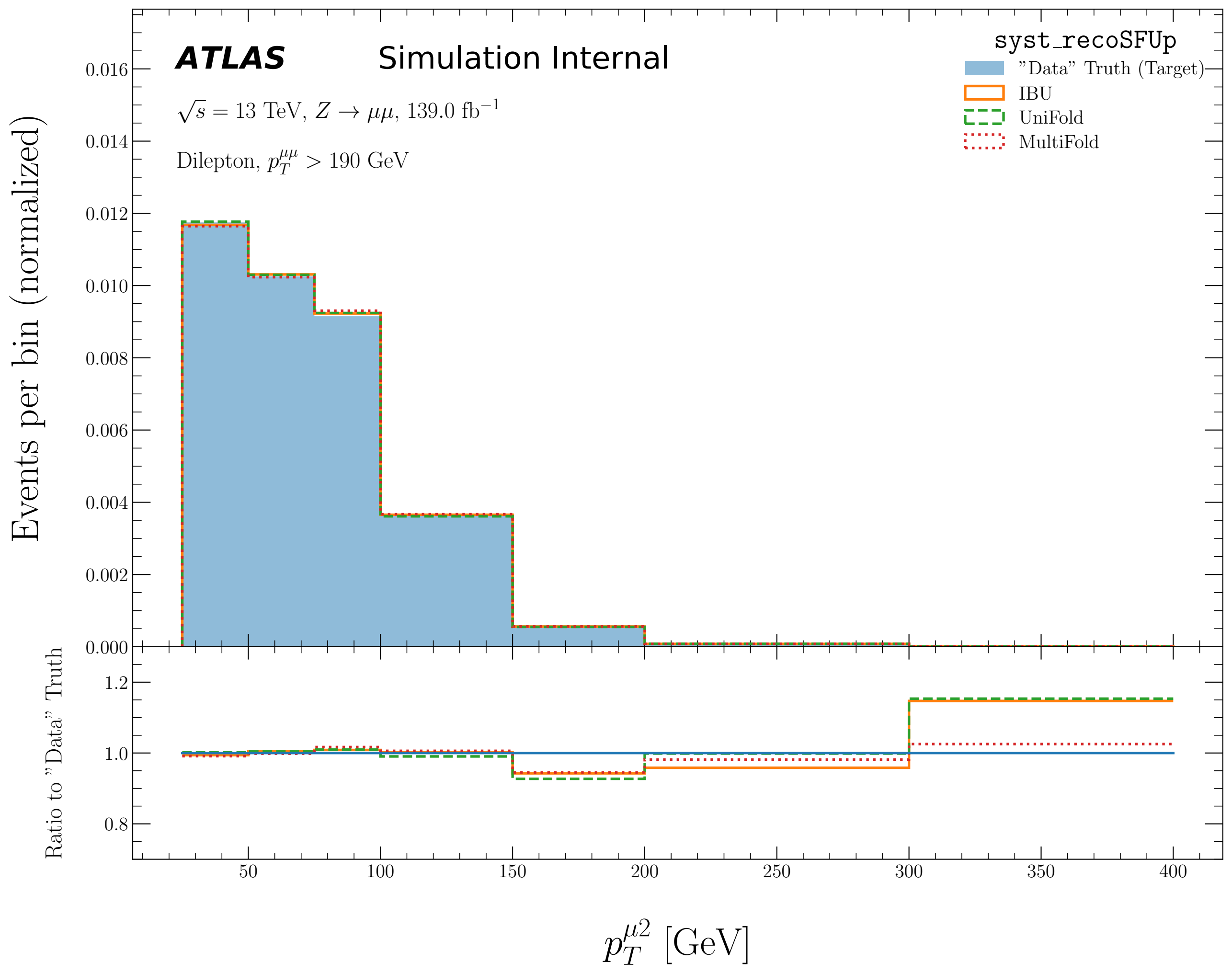


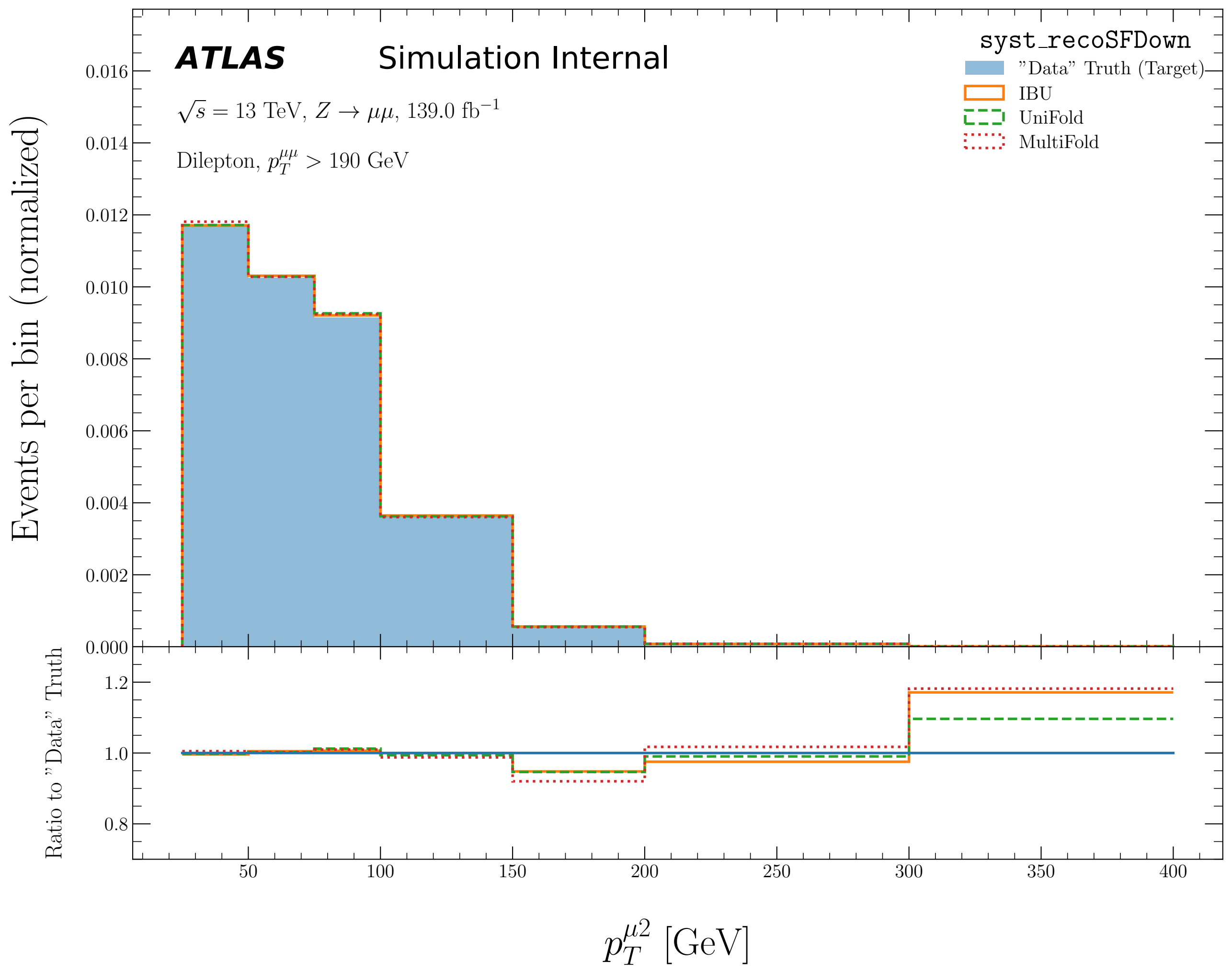


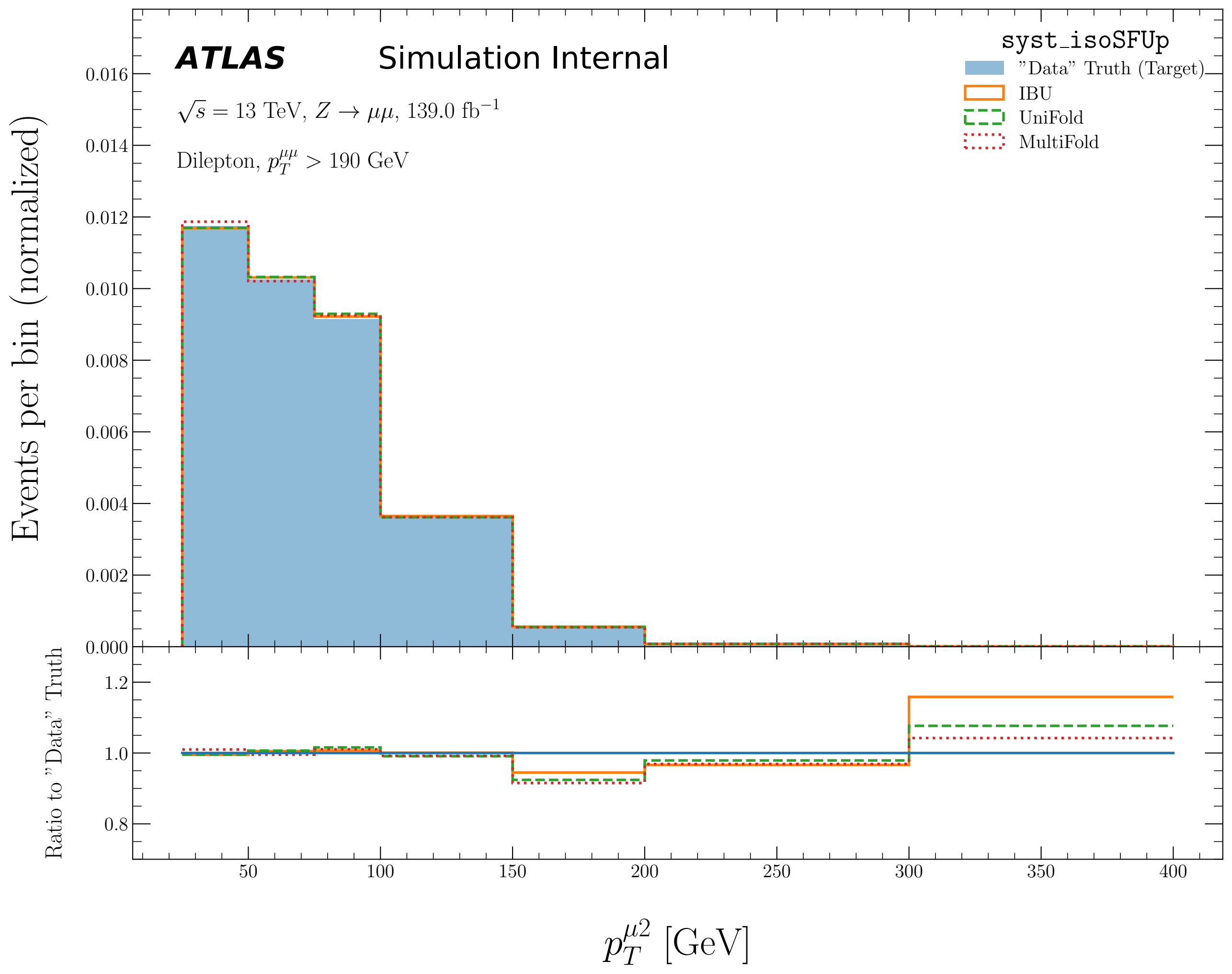


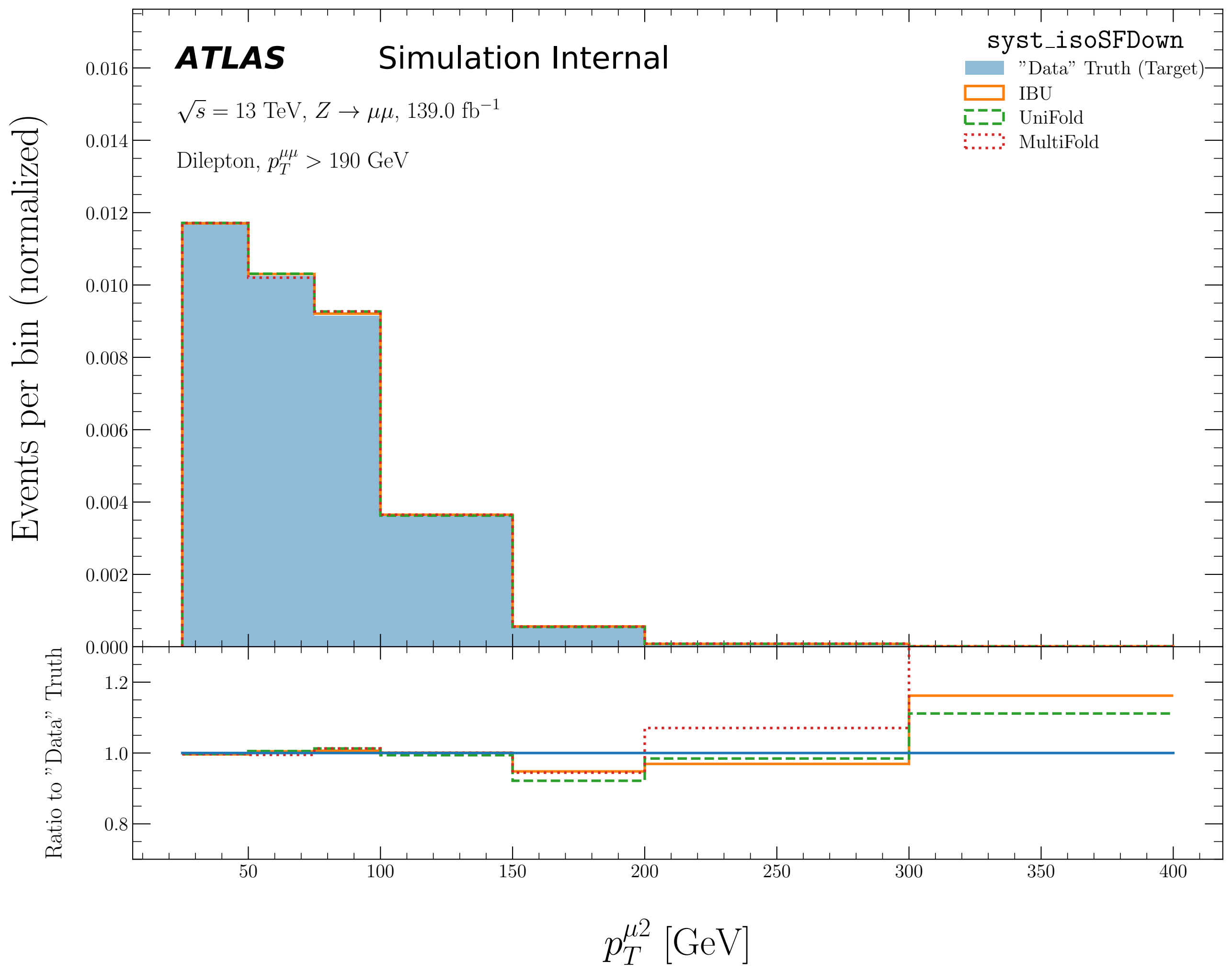


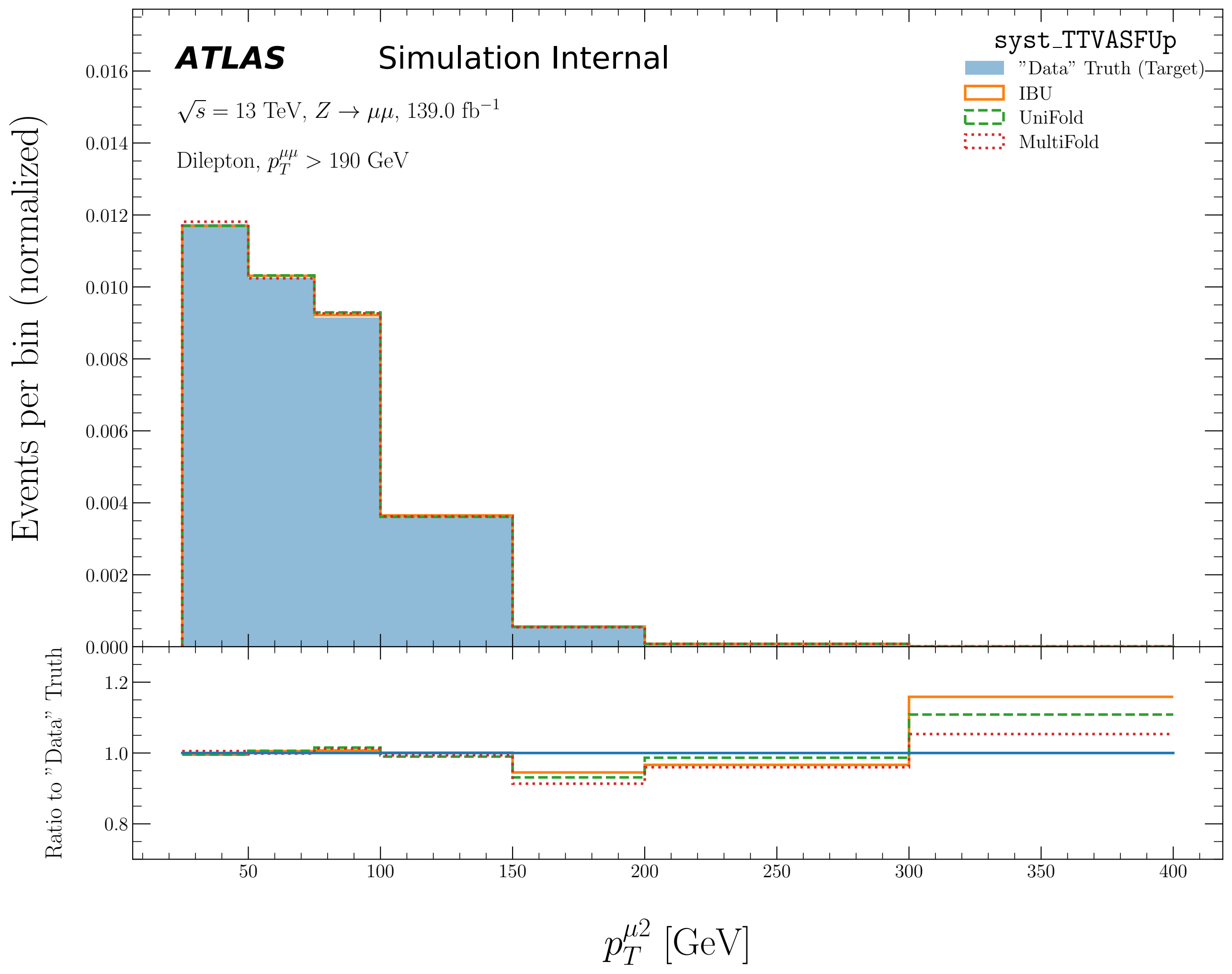


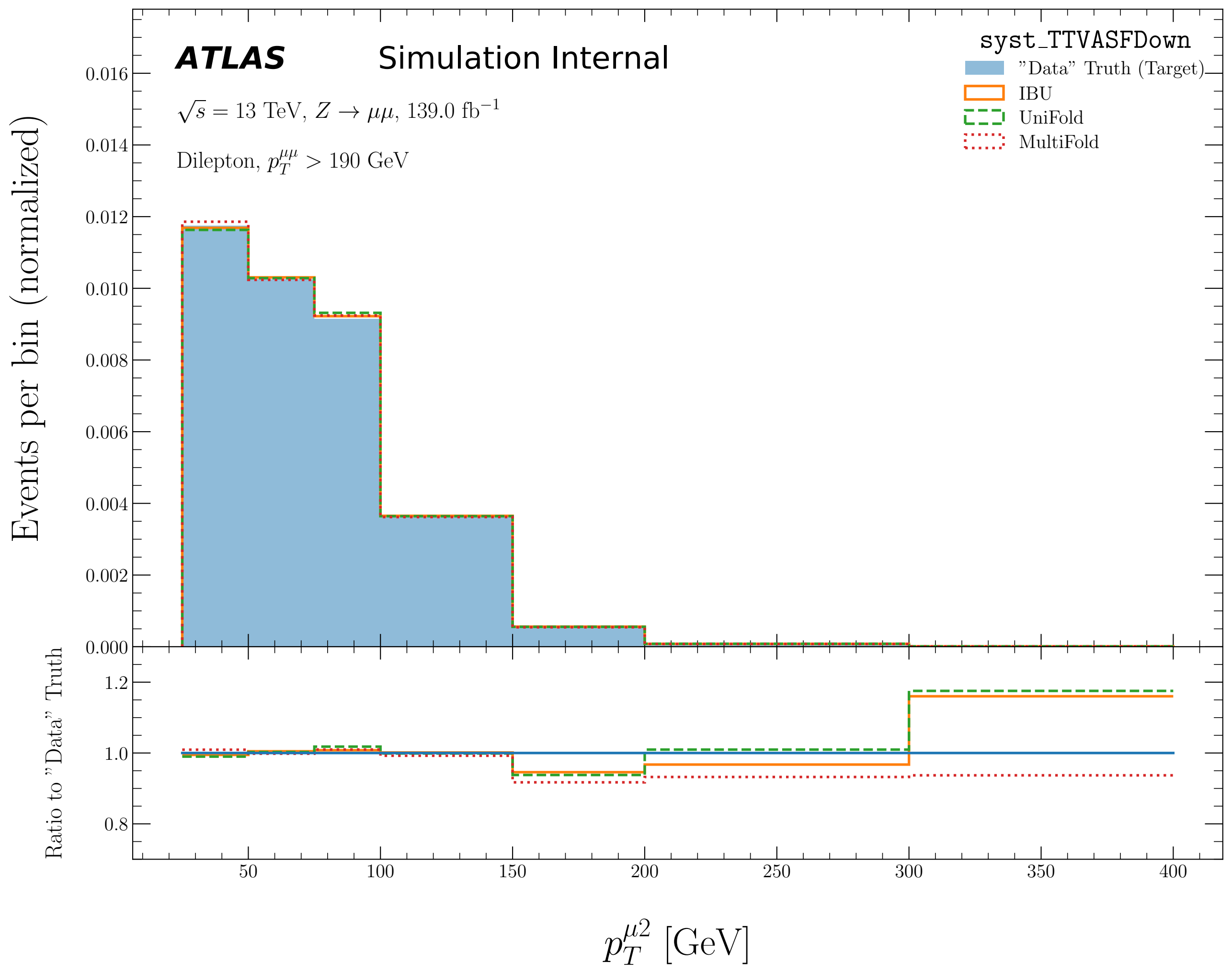


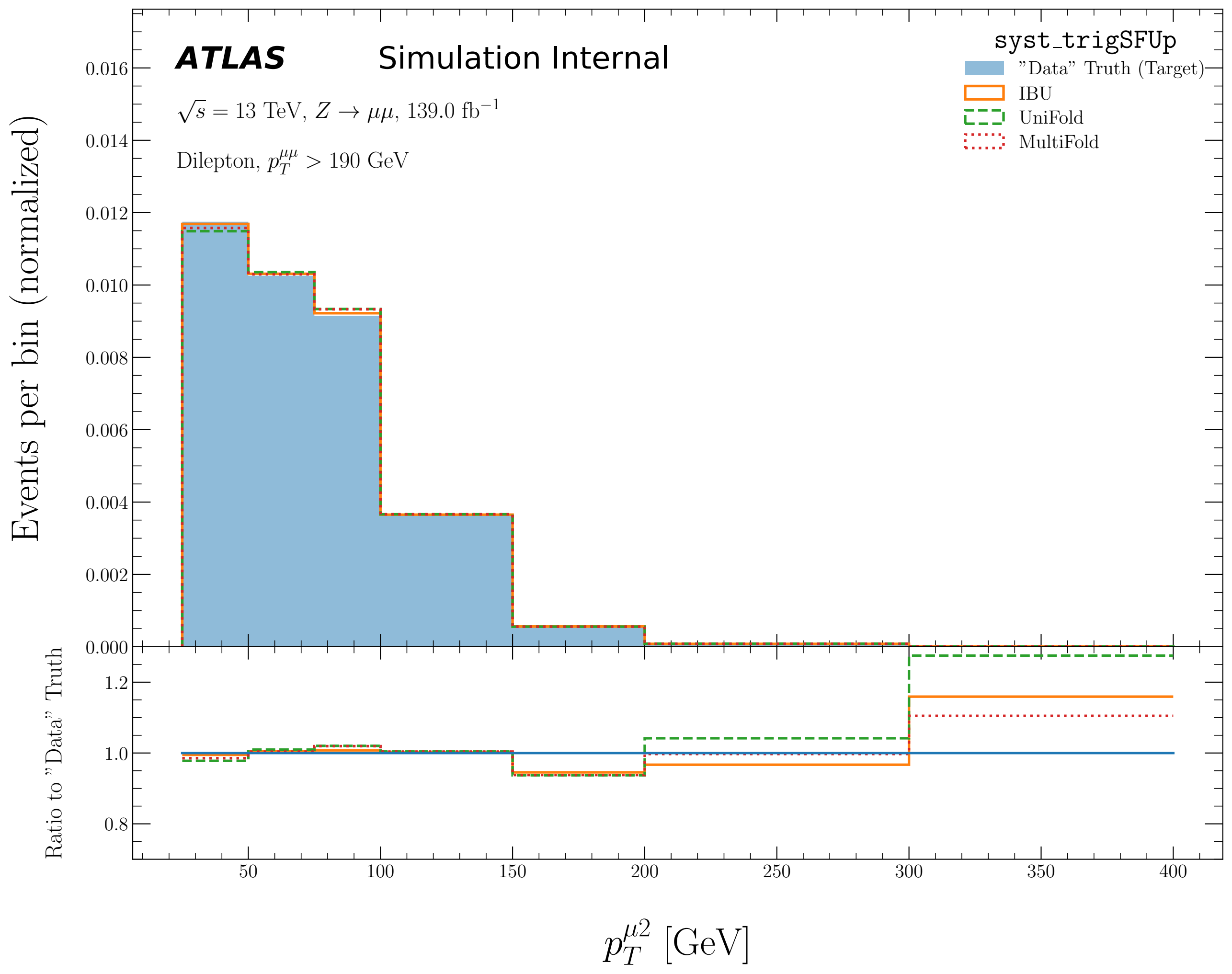


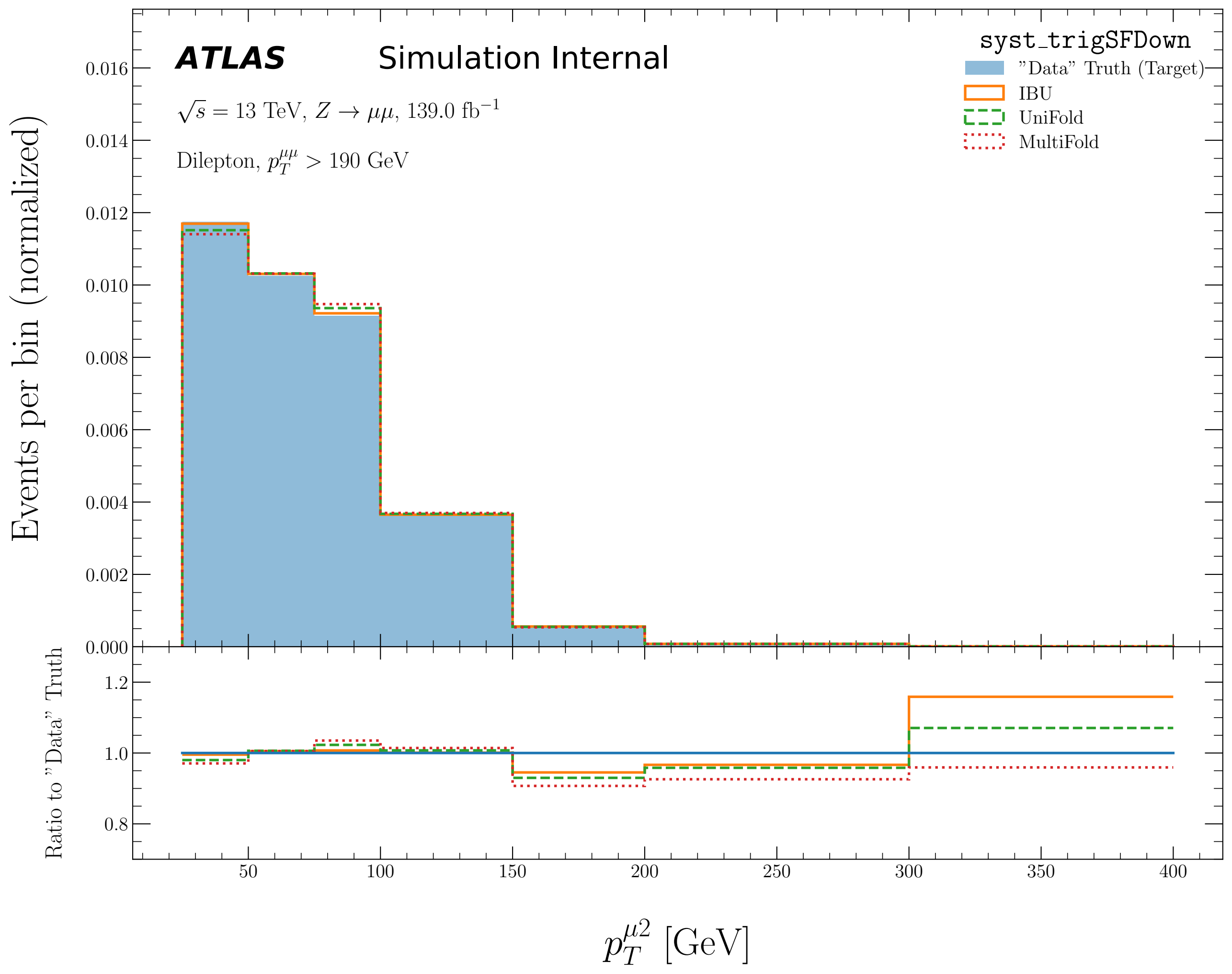




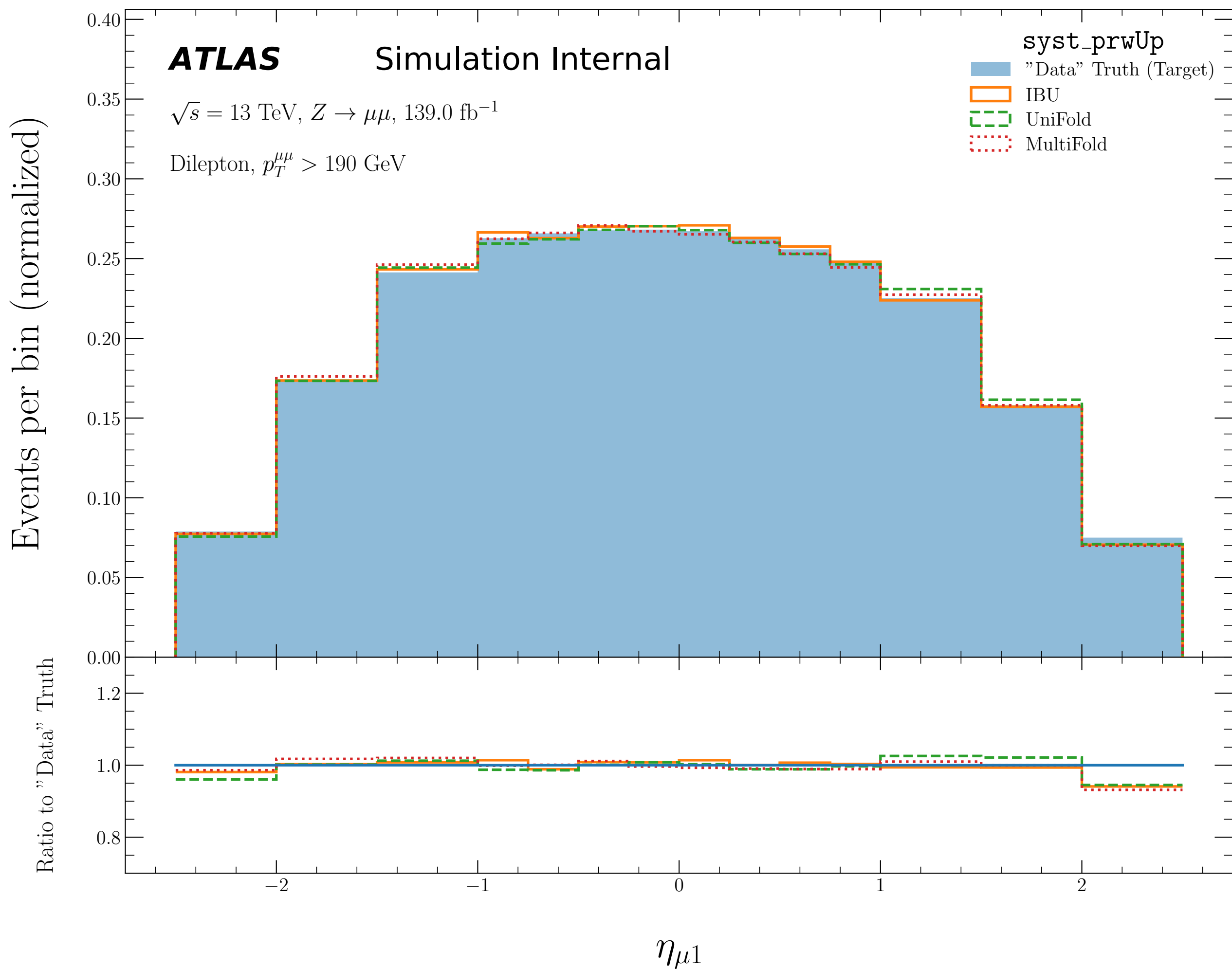


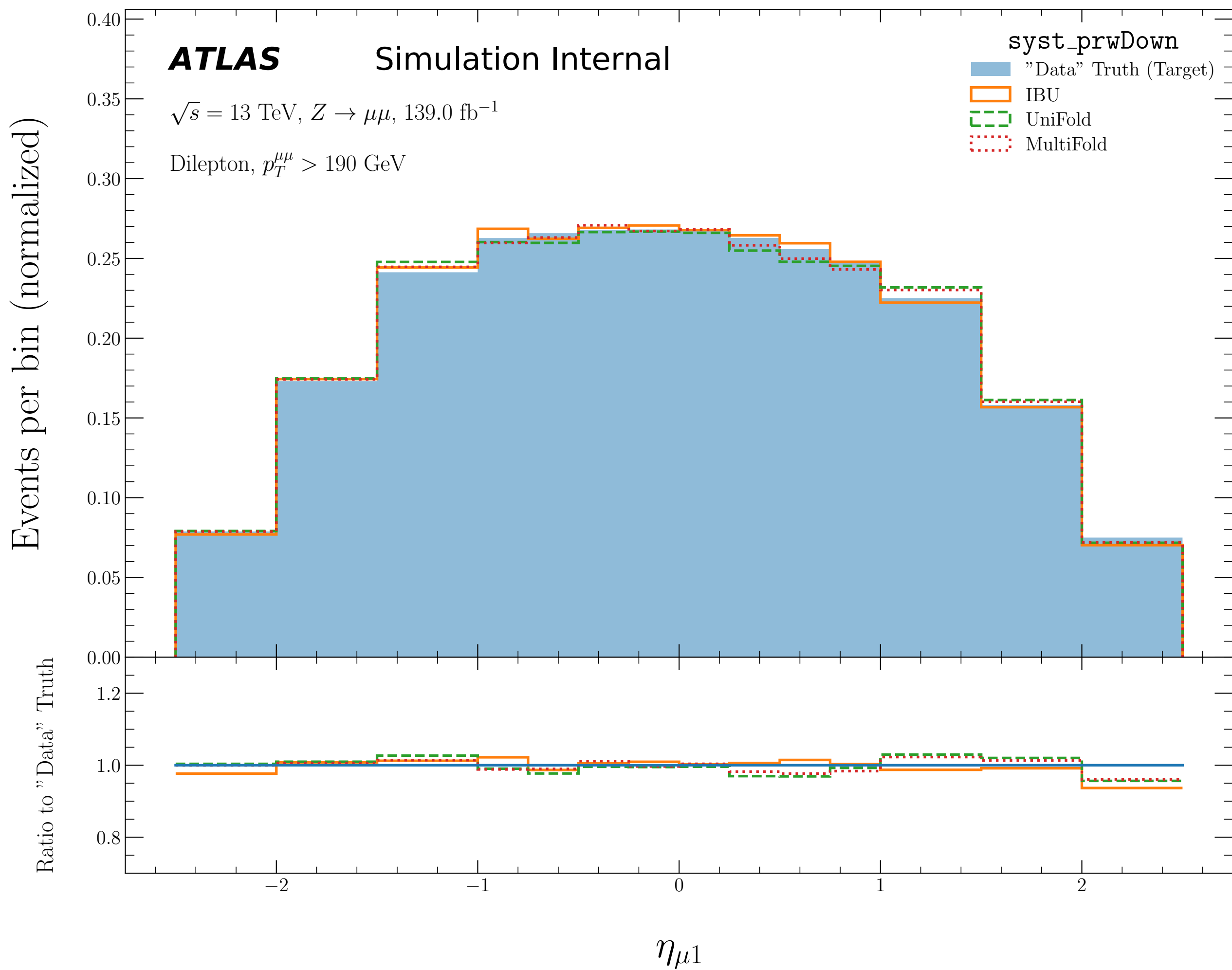


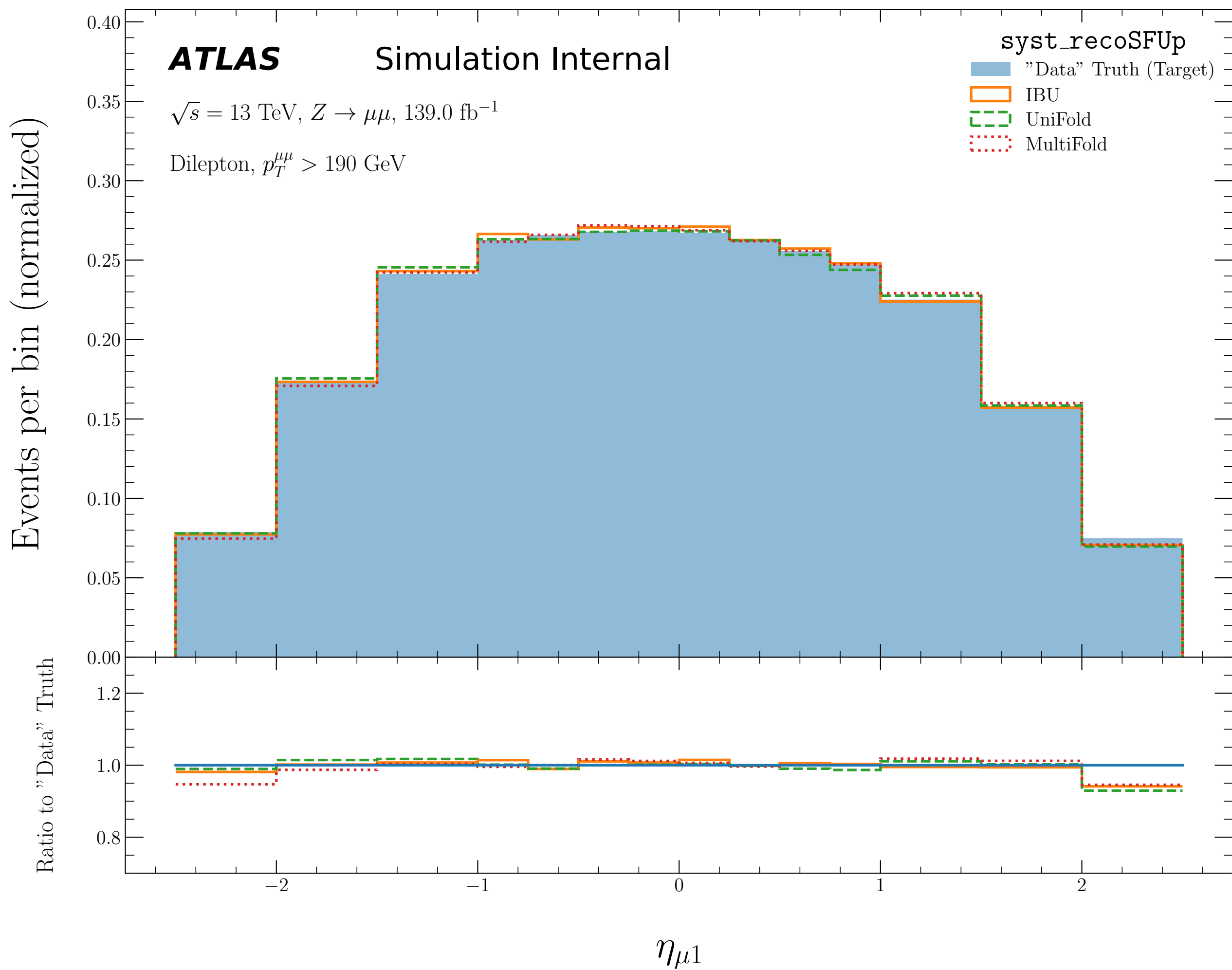


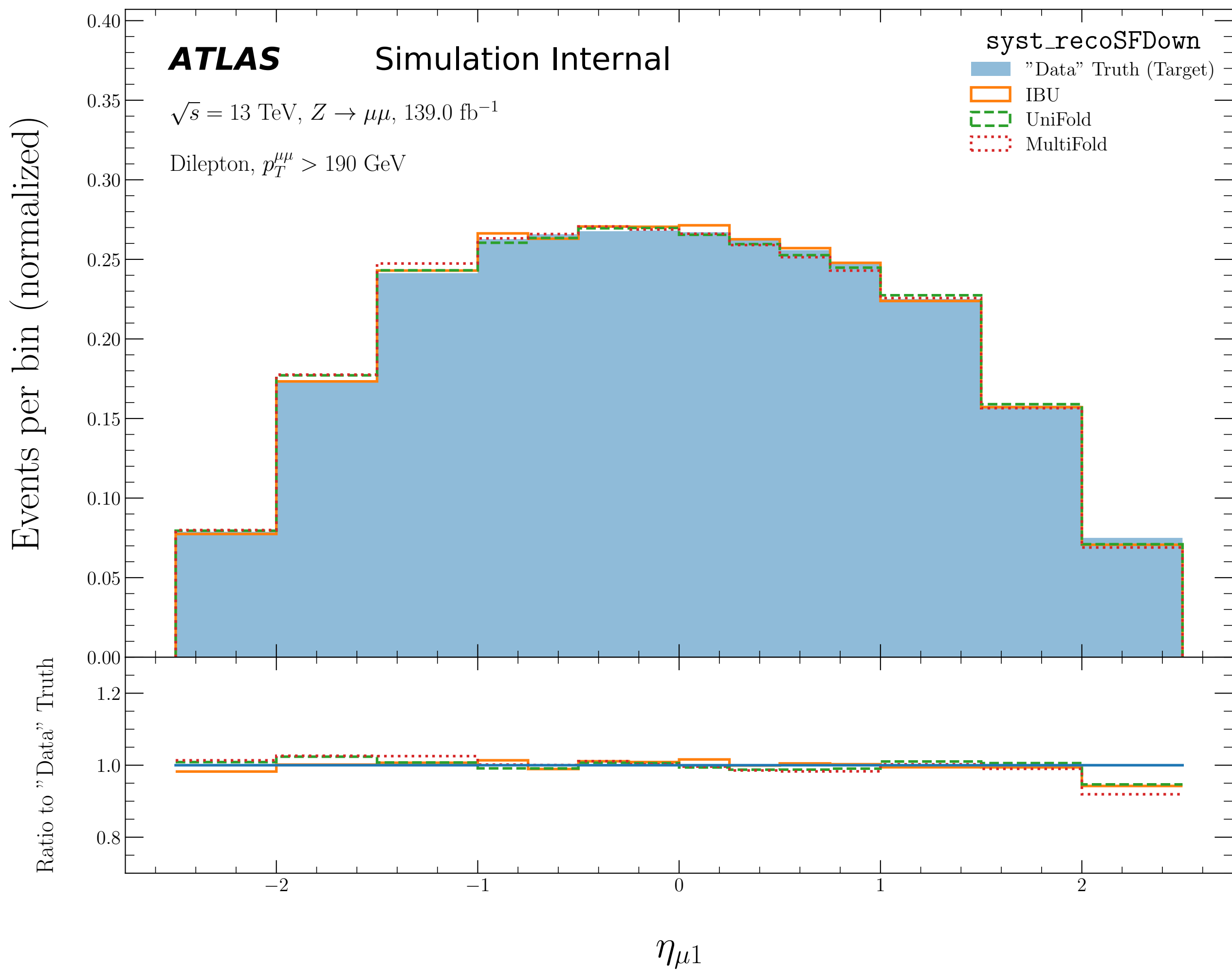


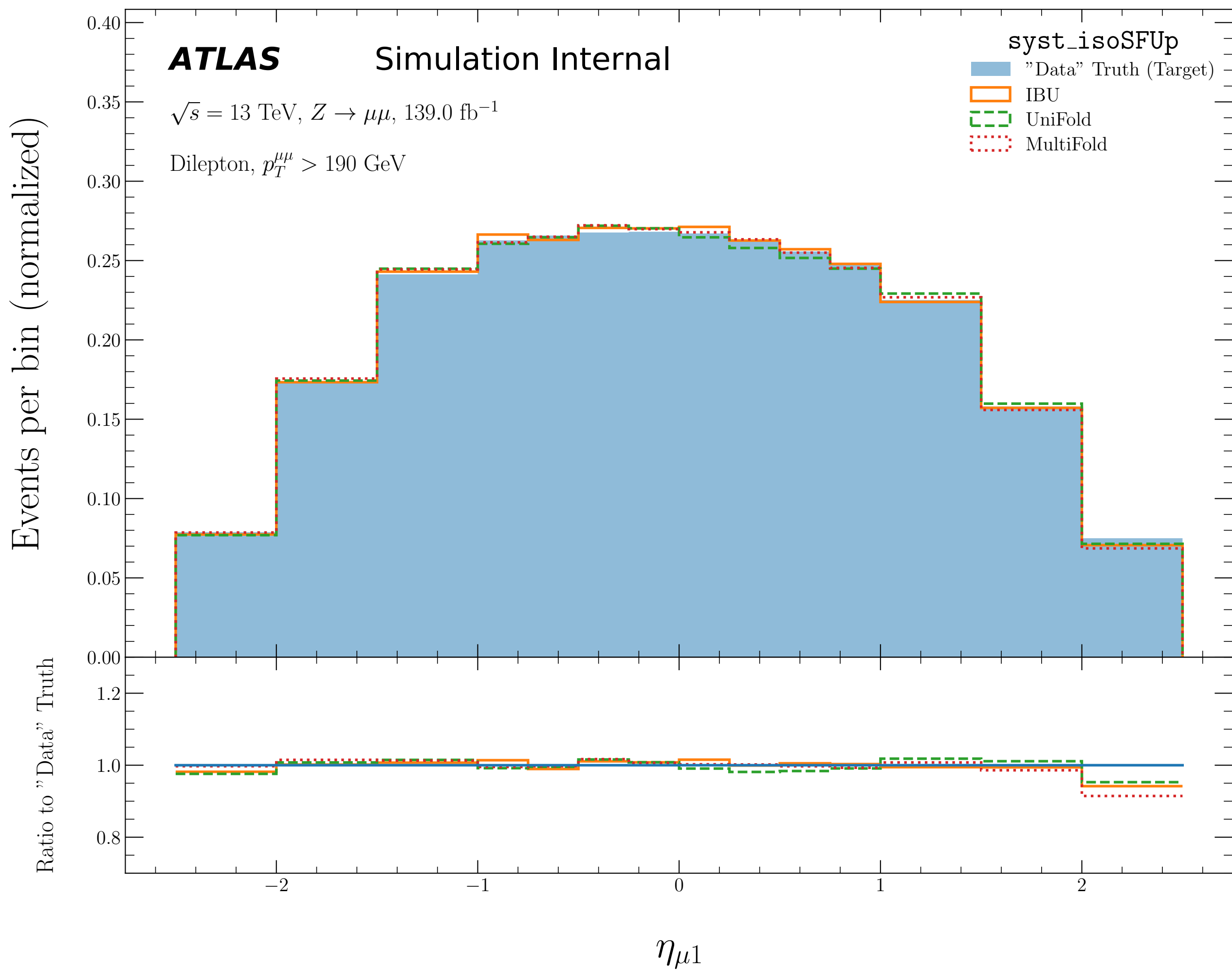


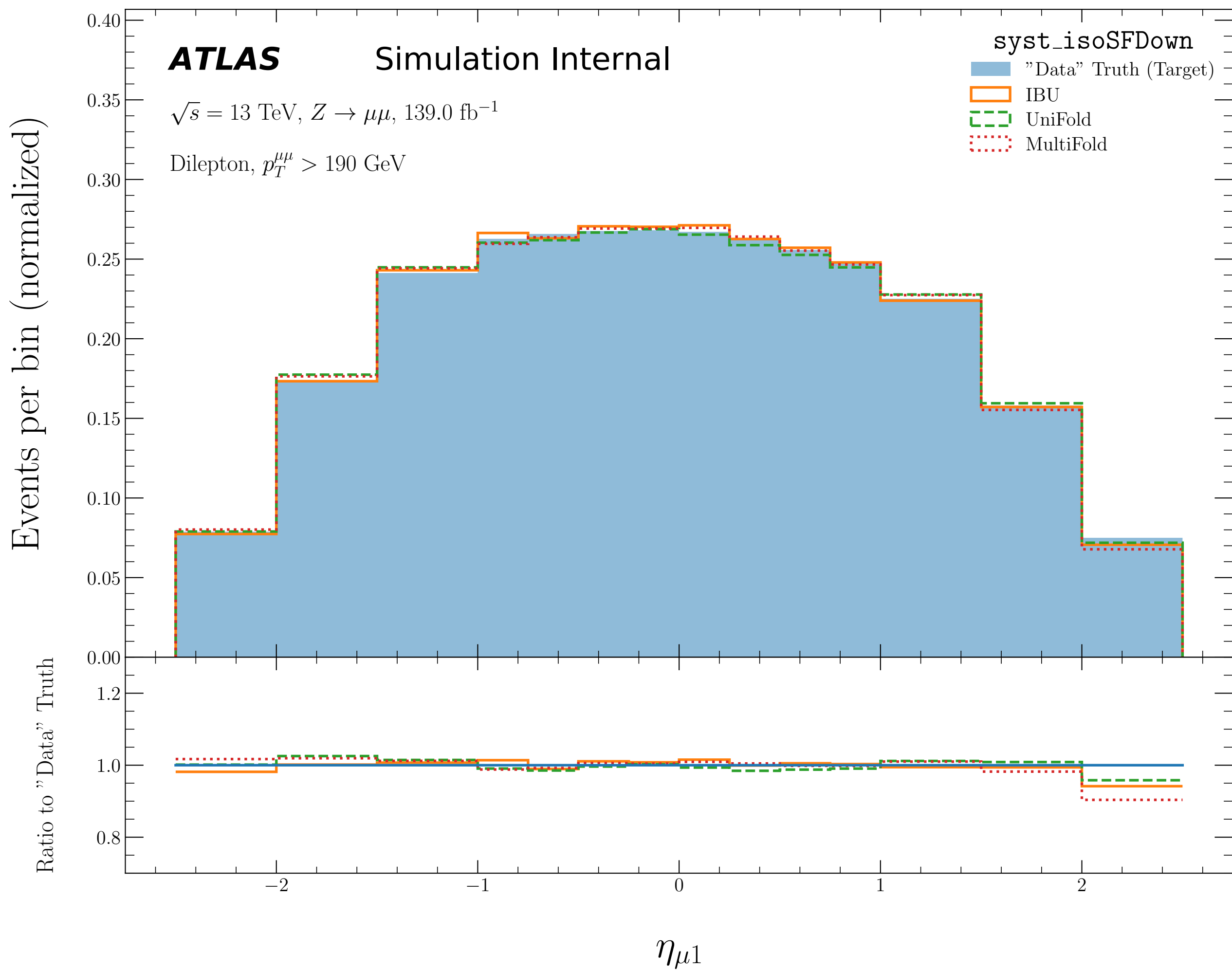


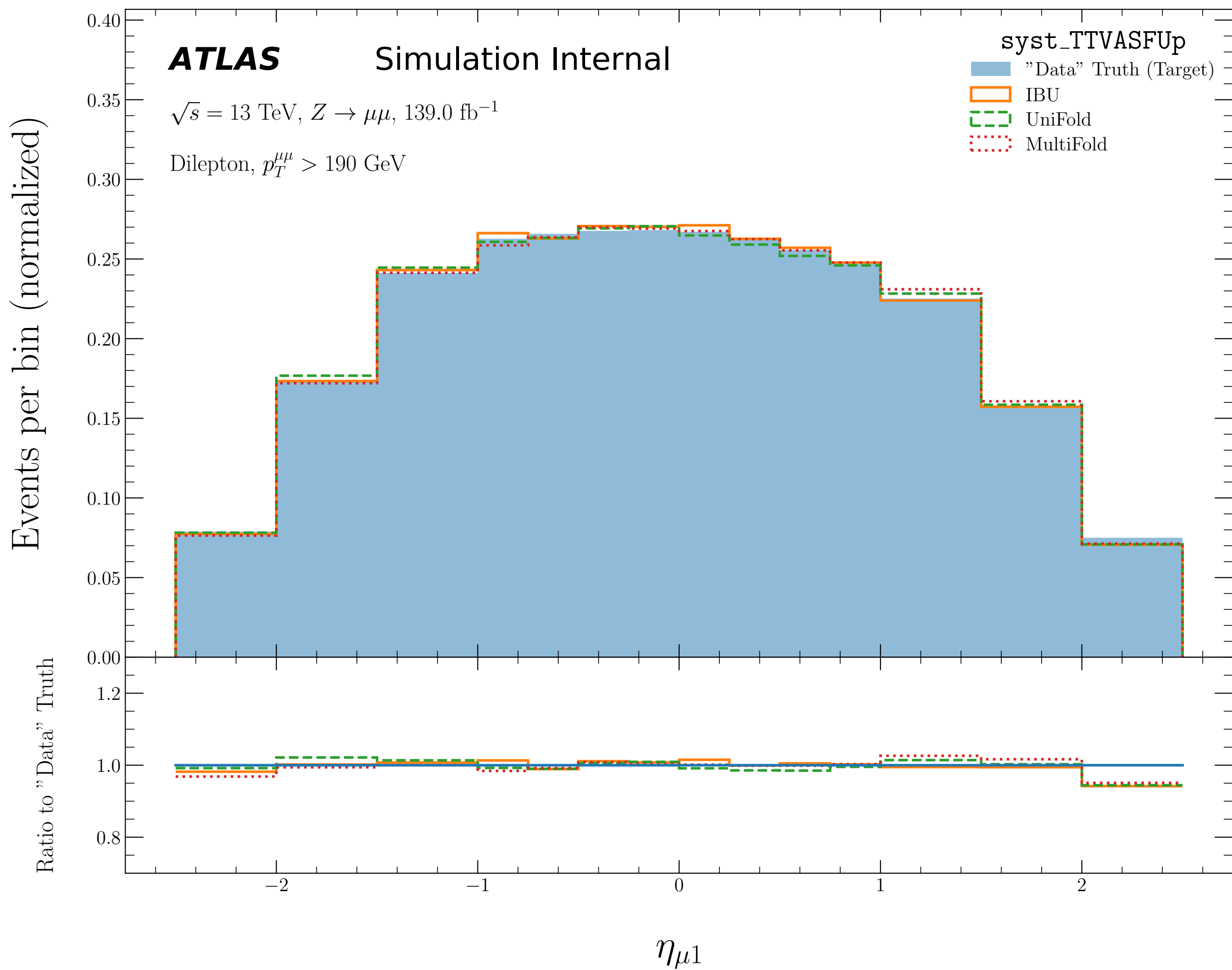


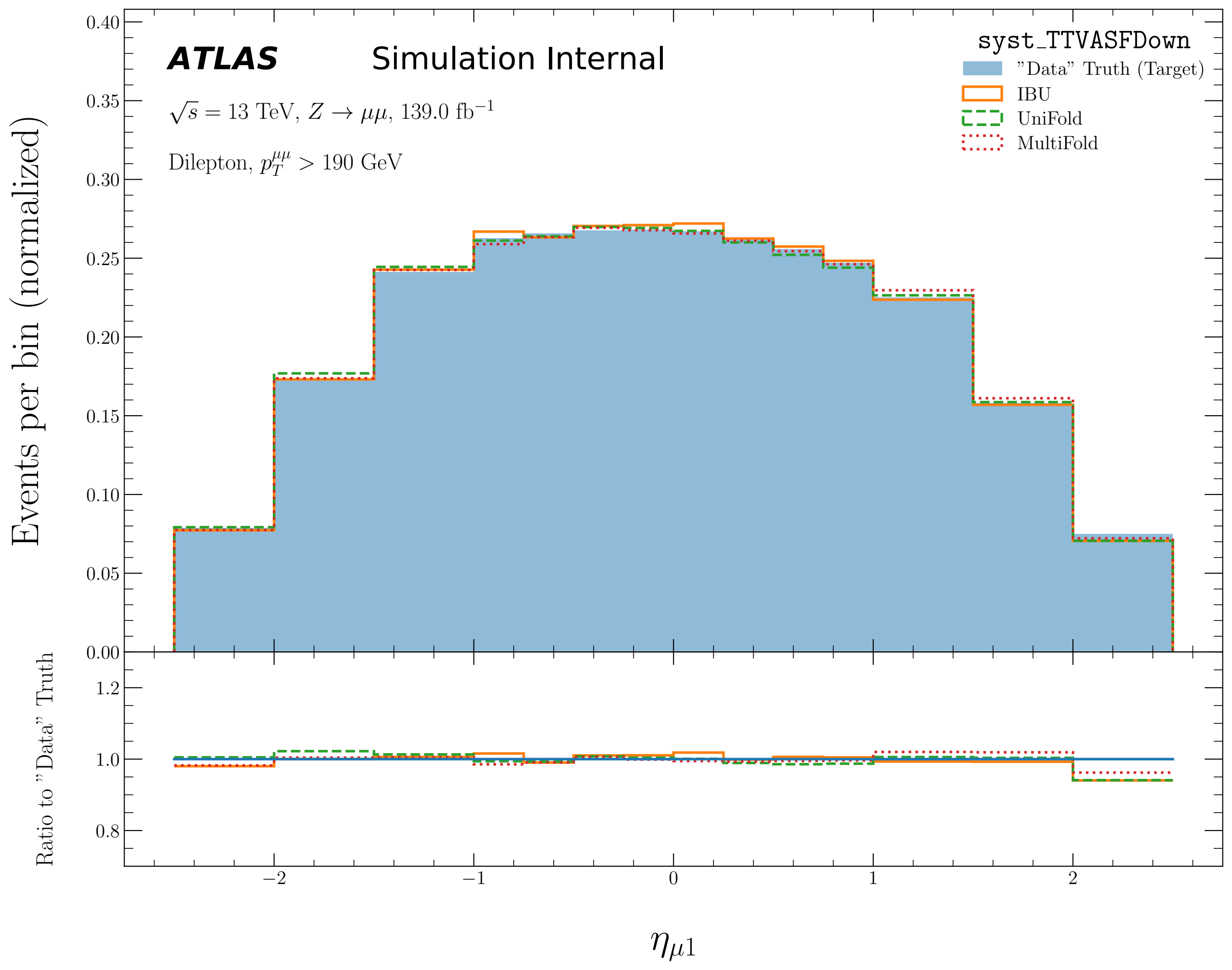




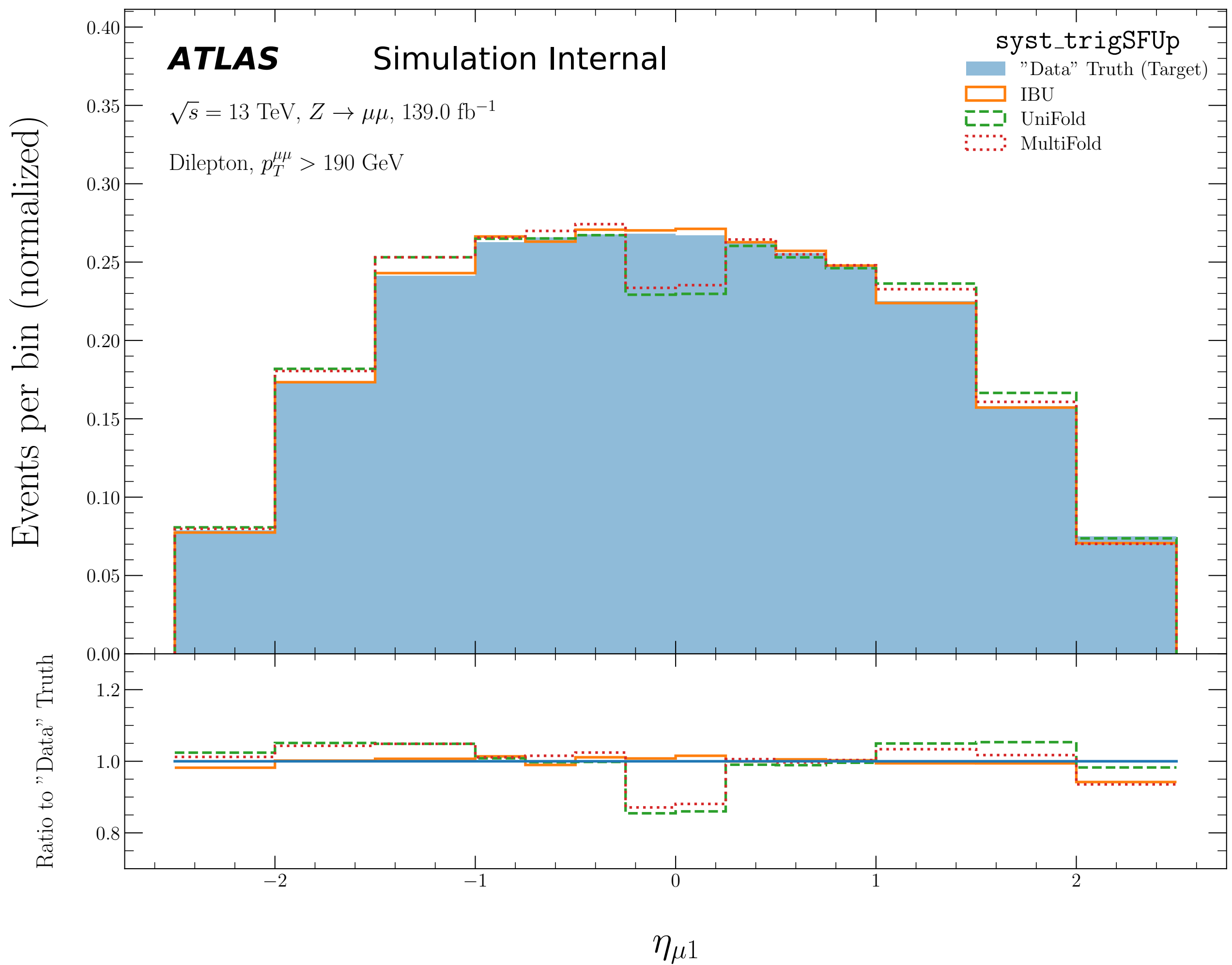


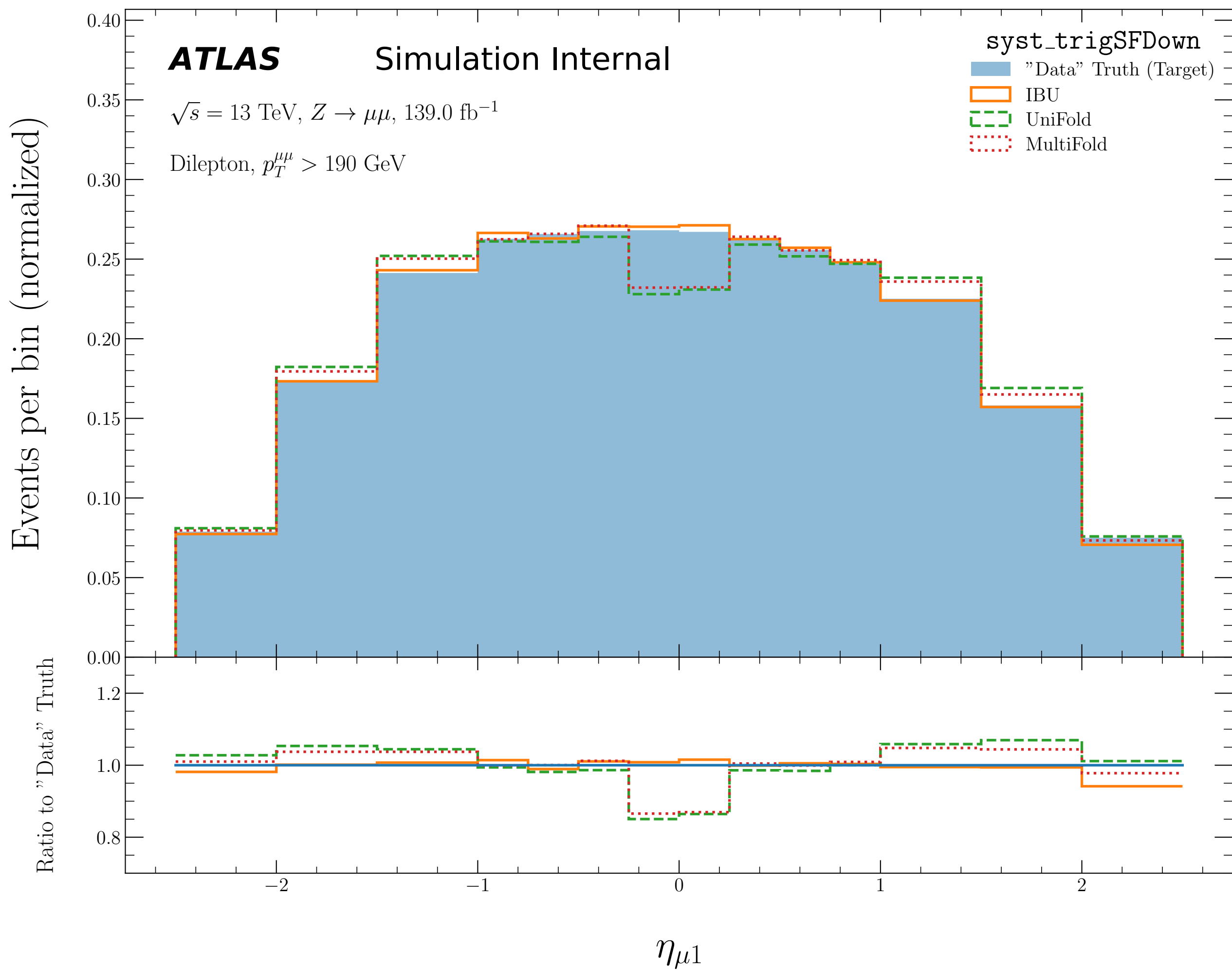


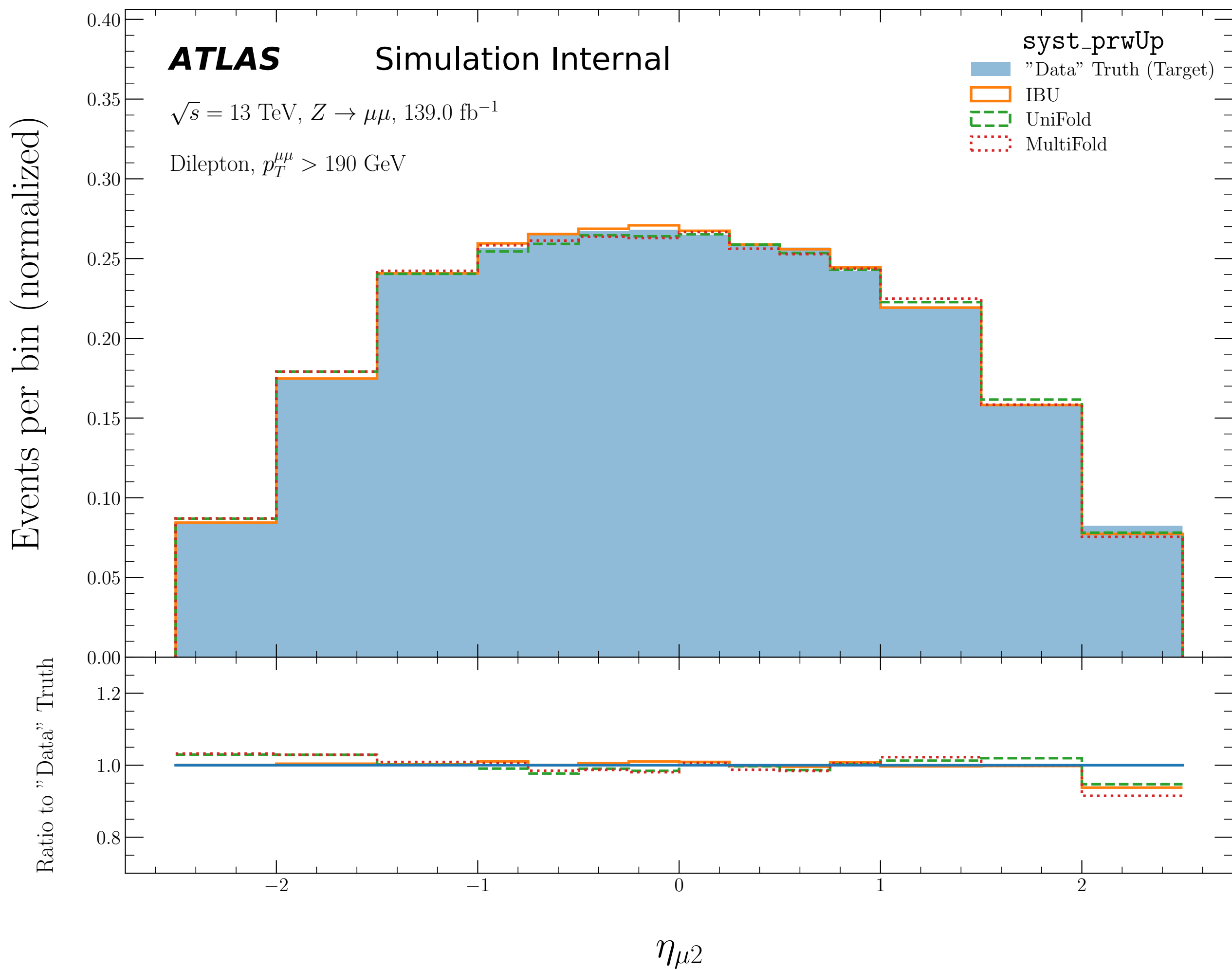


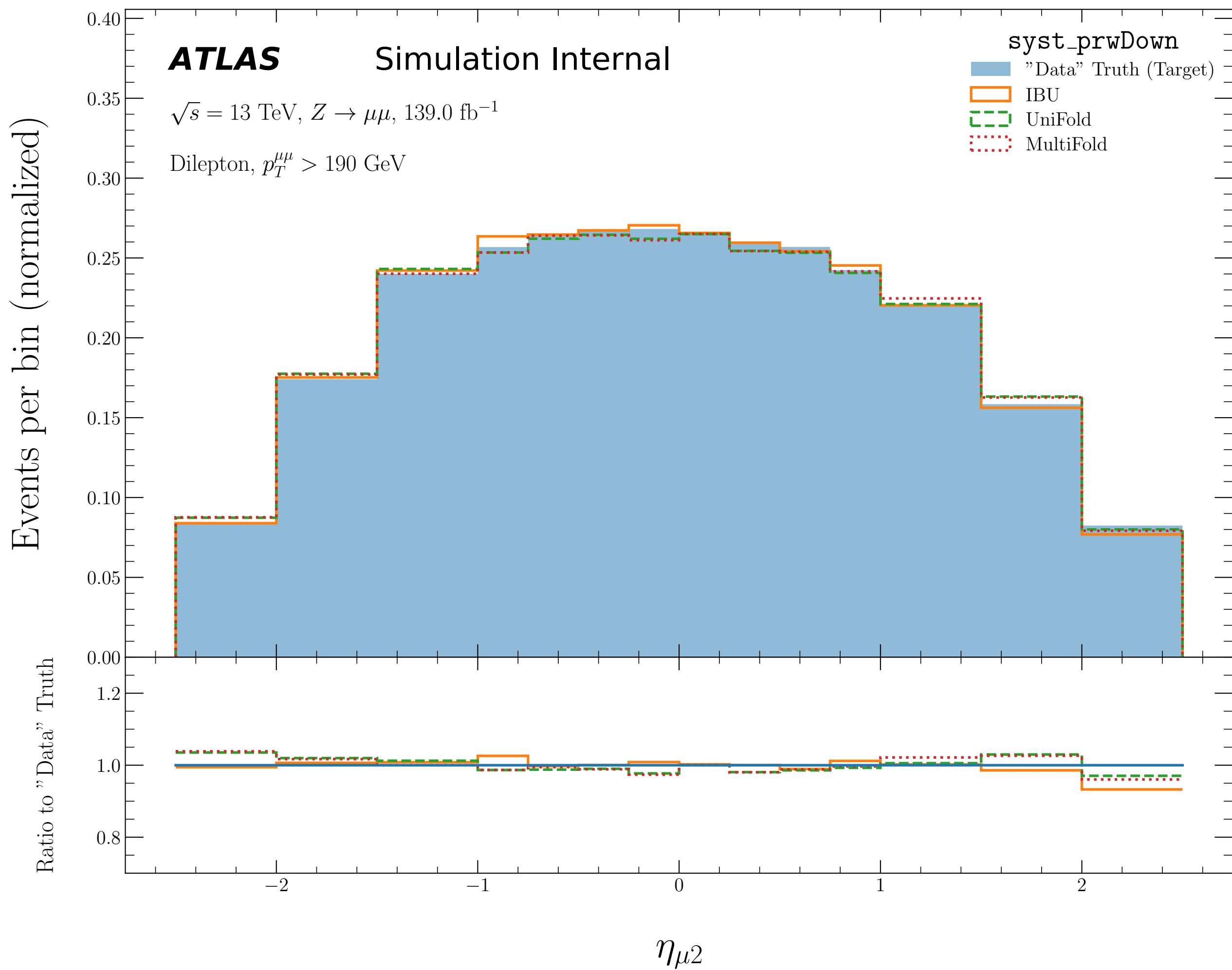


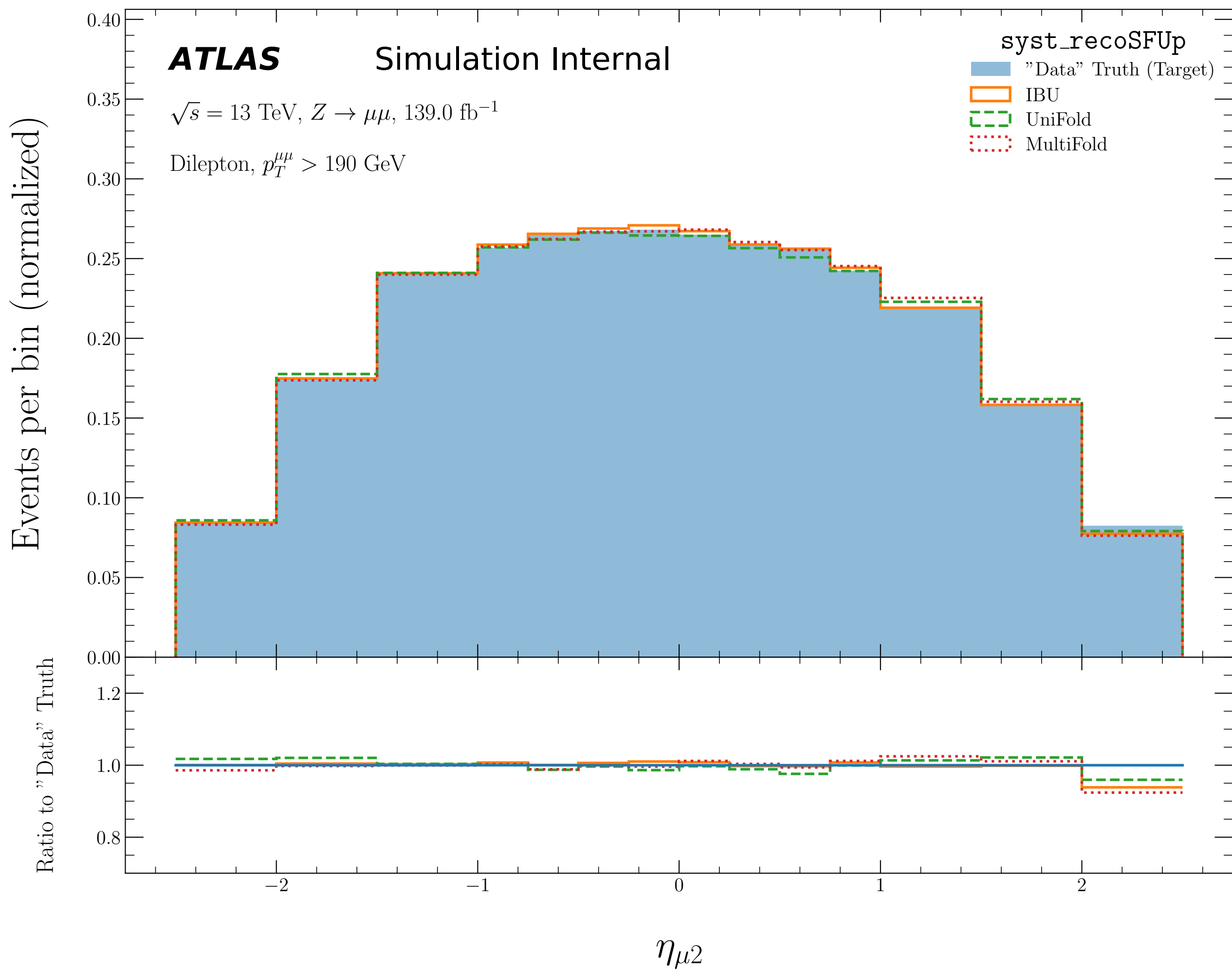


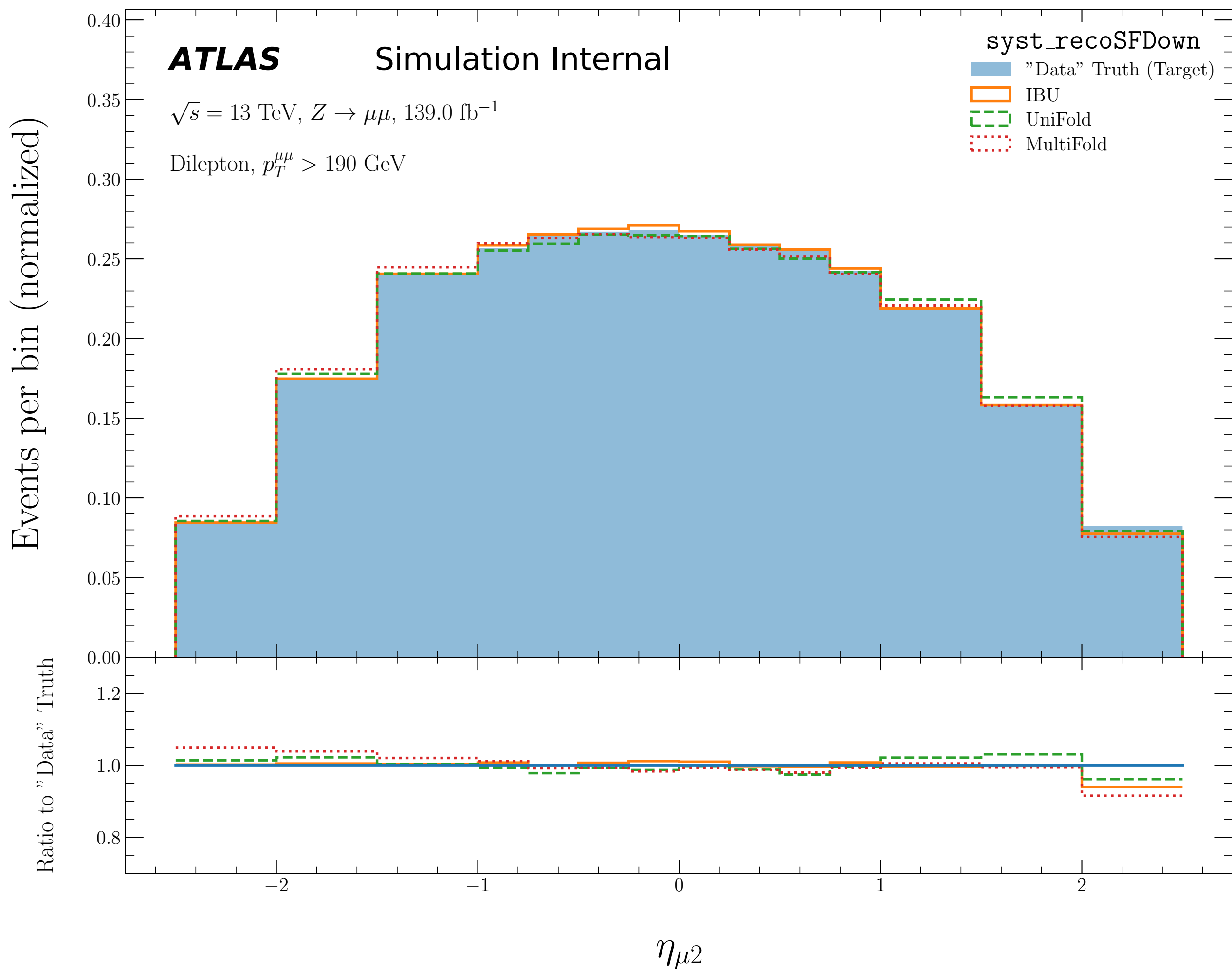


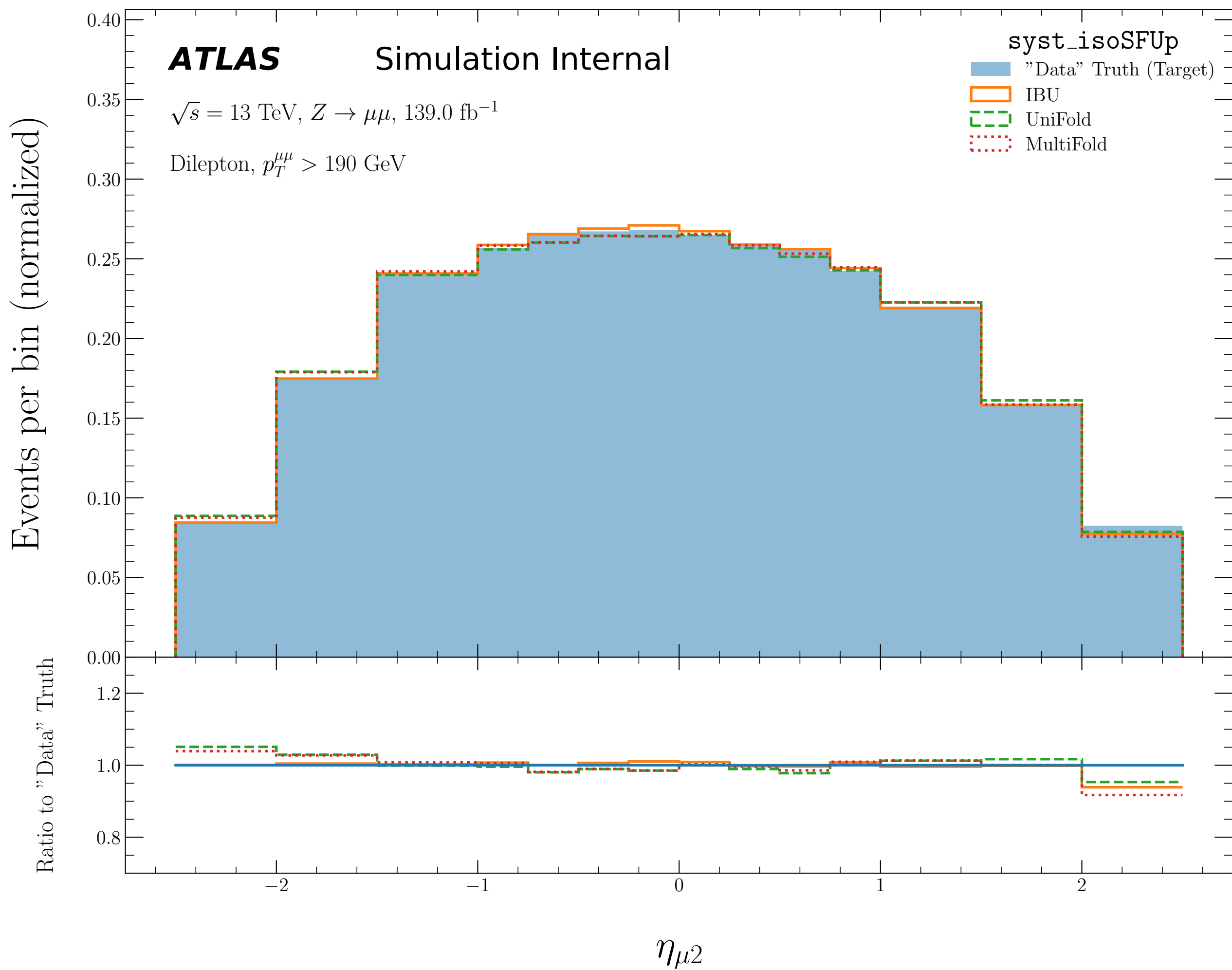


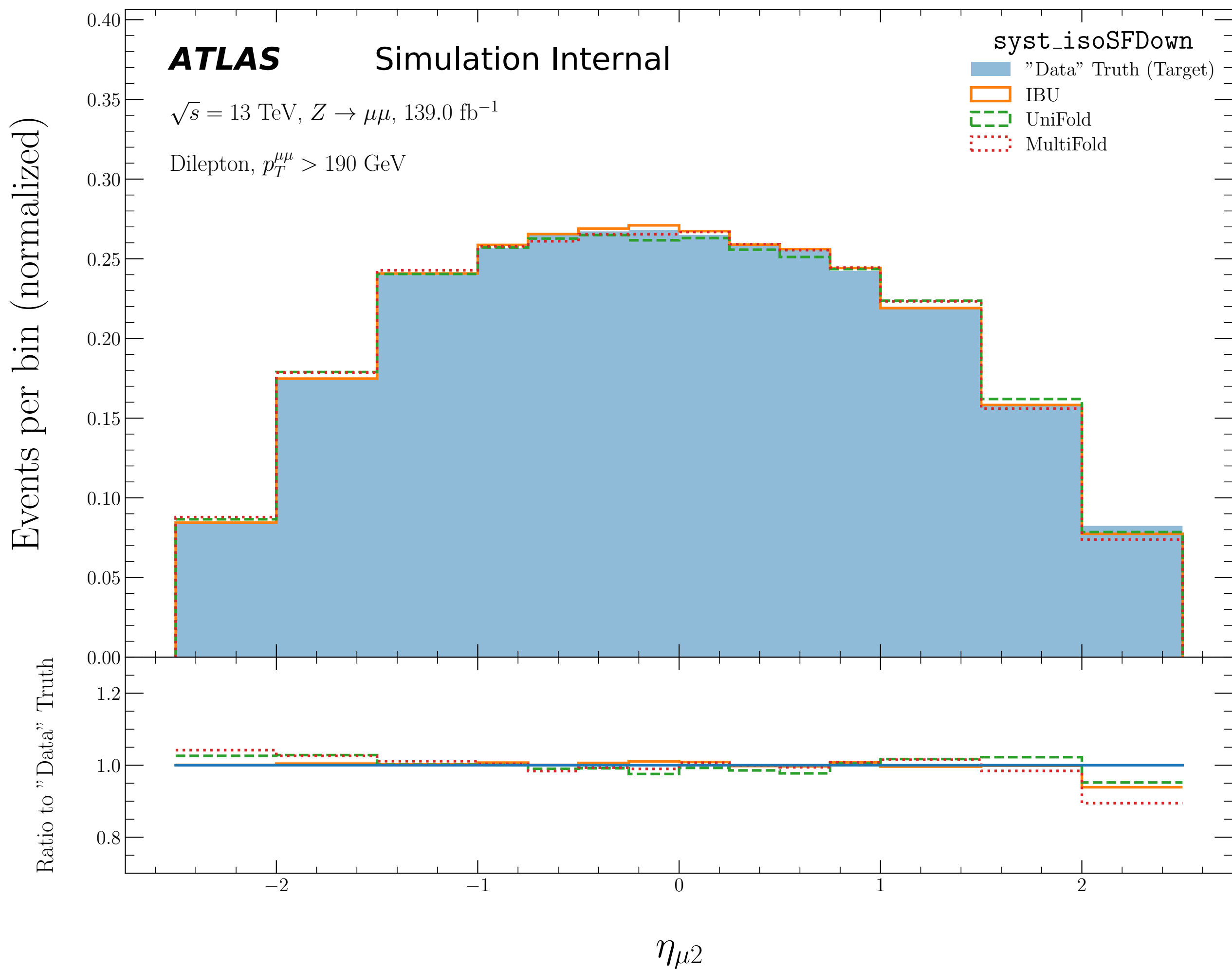




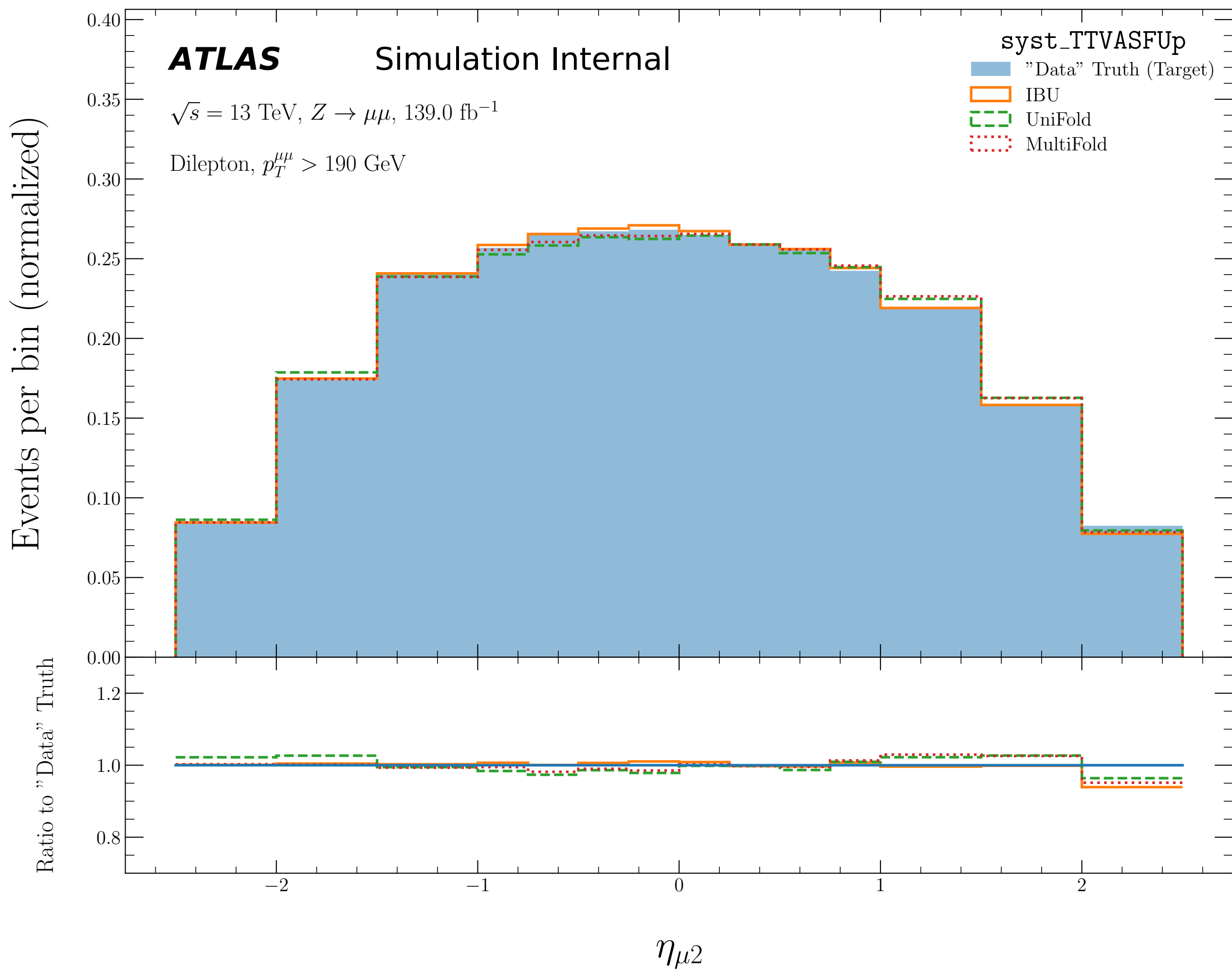


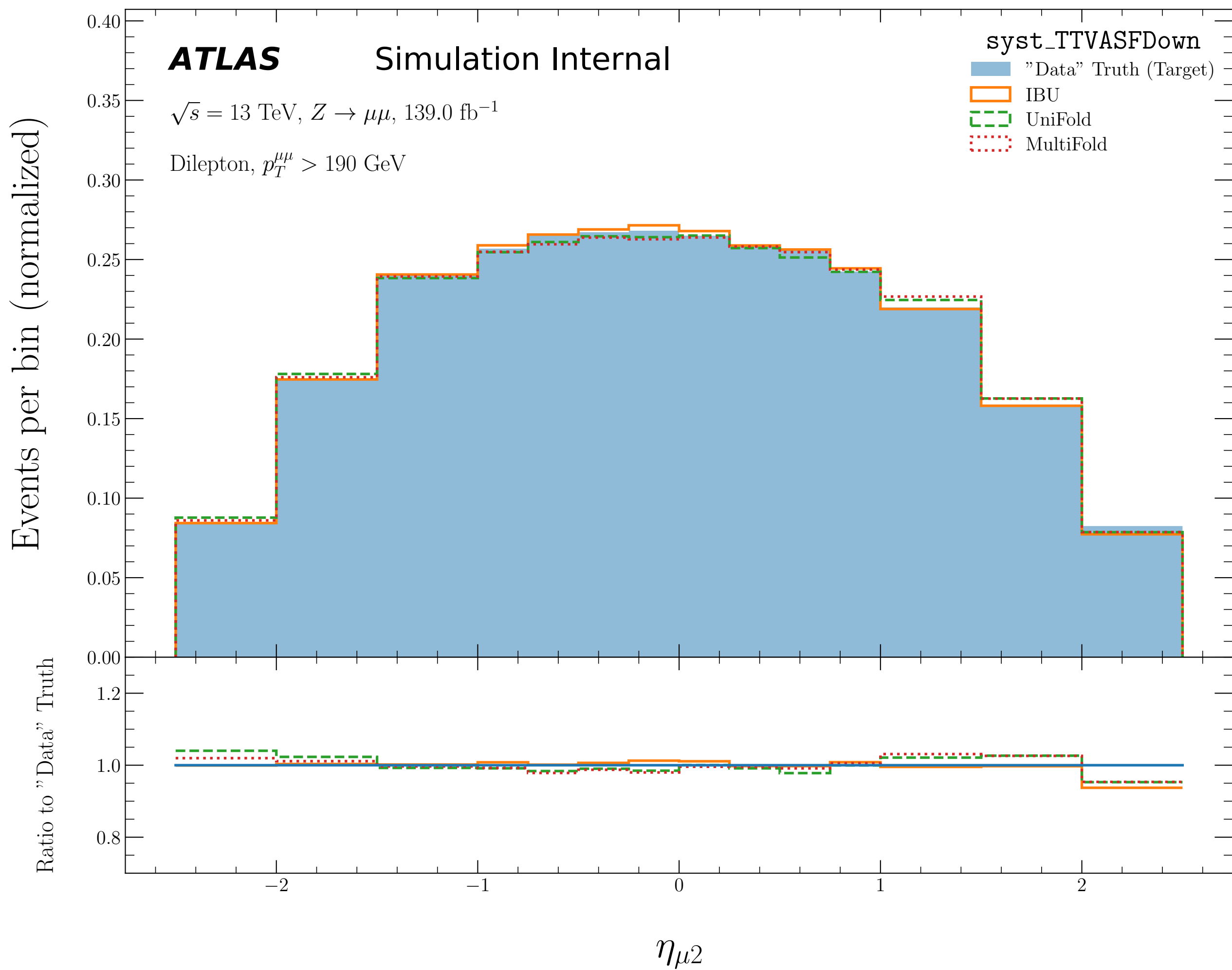


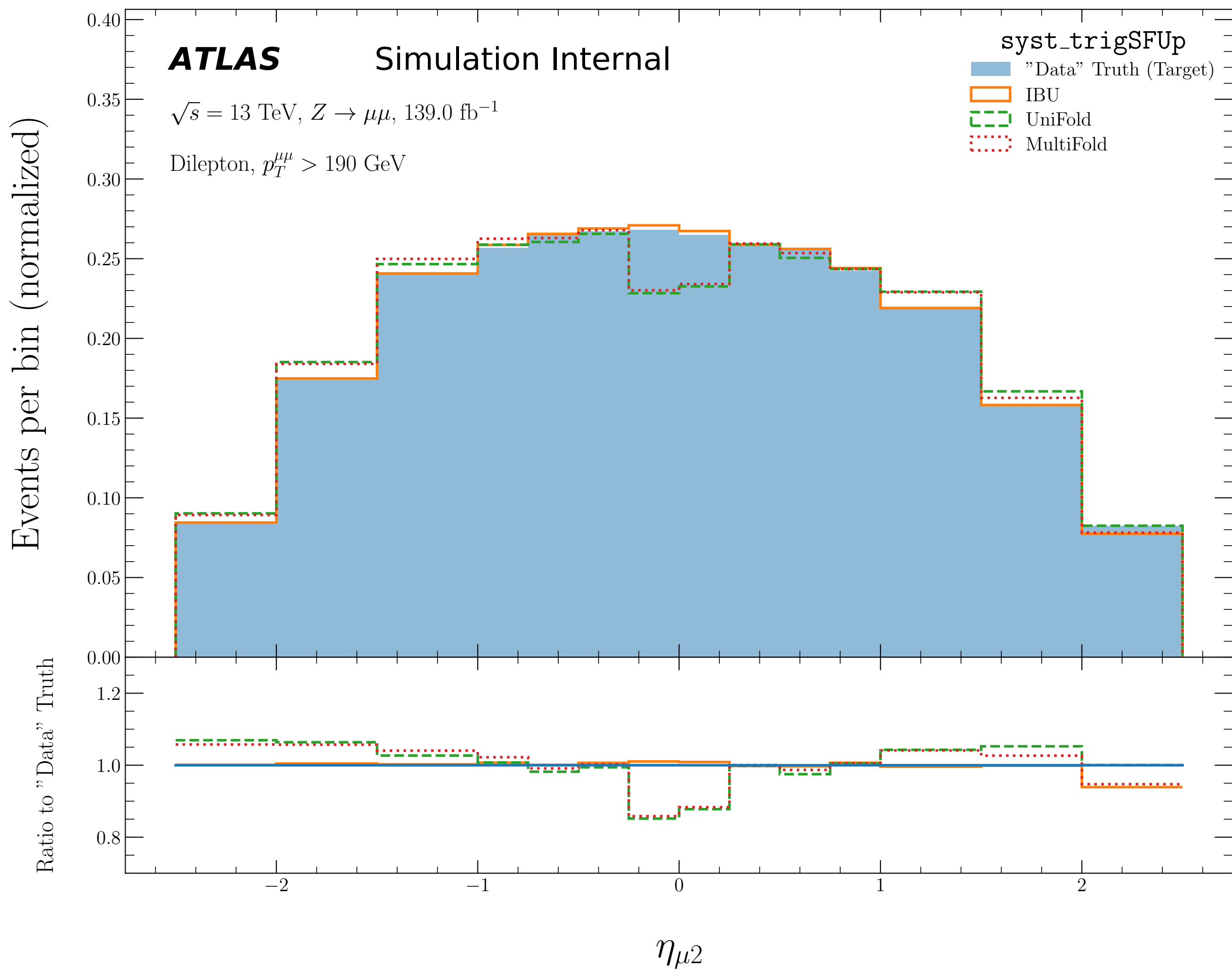


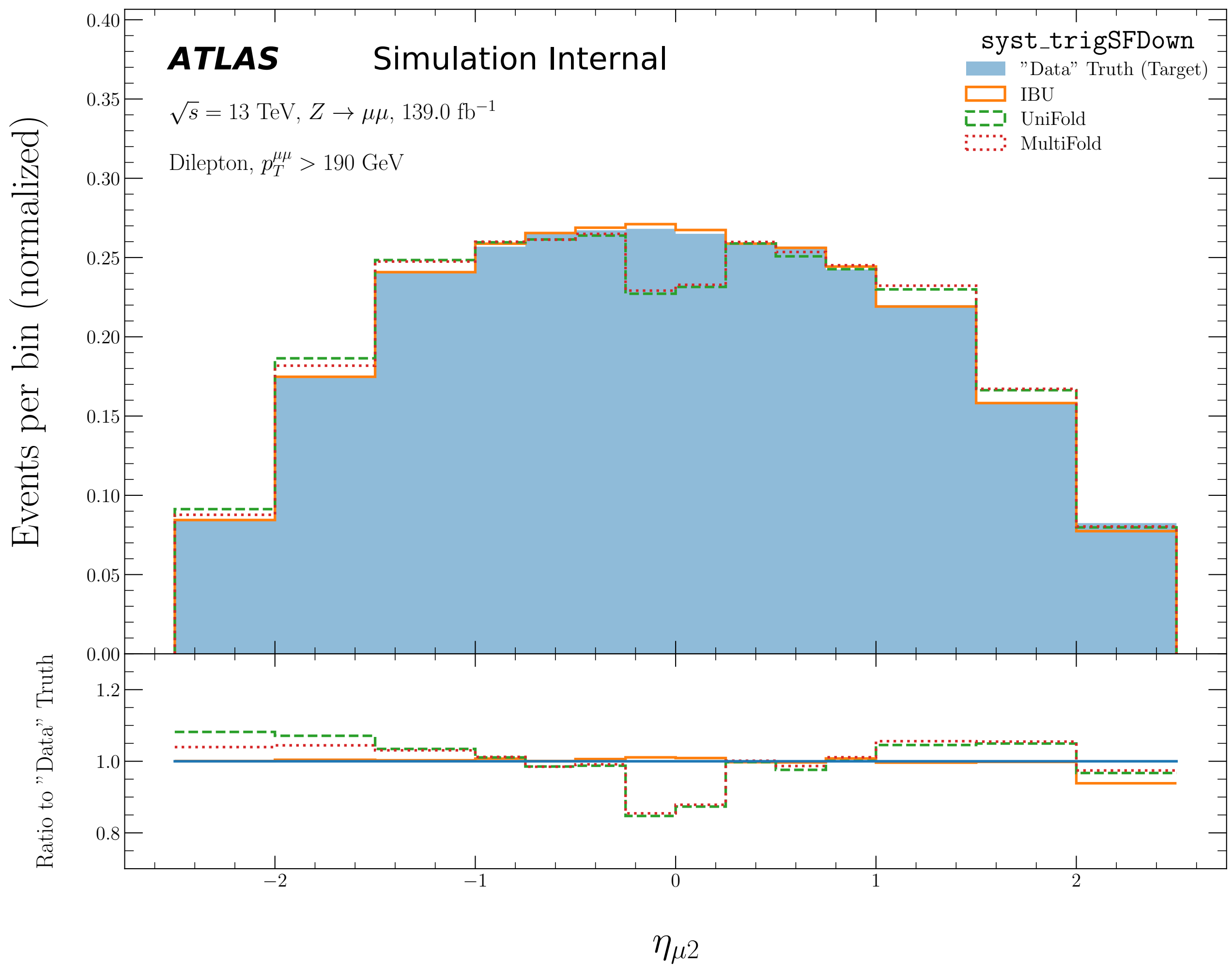












Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_prwUp

"Data" Truth (Target)

IBU

UniFold

MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

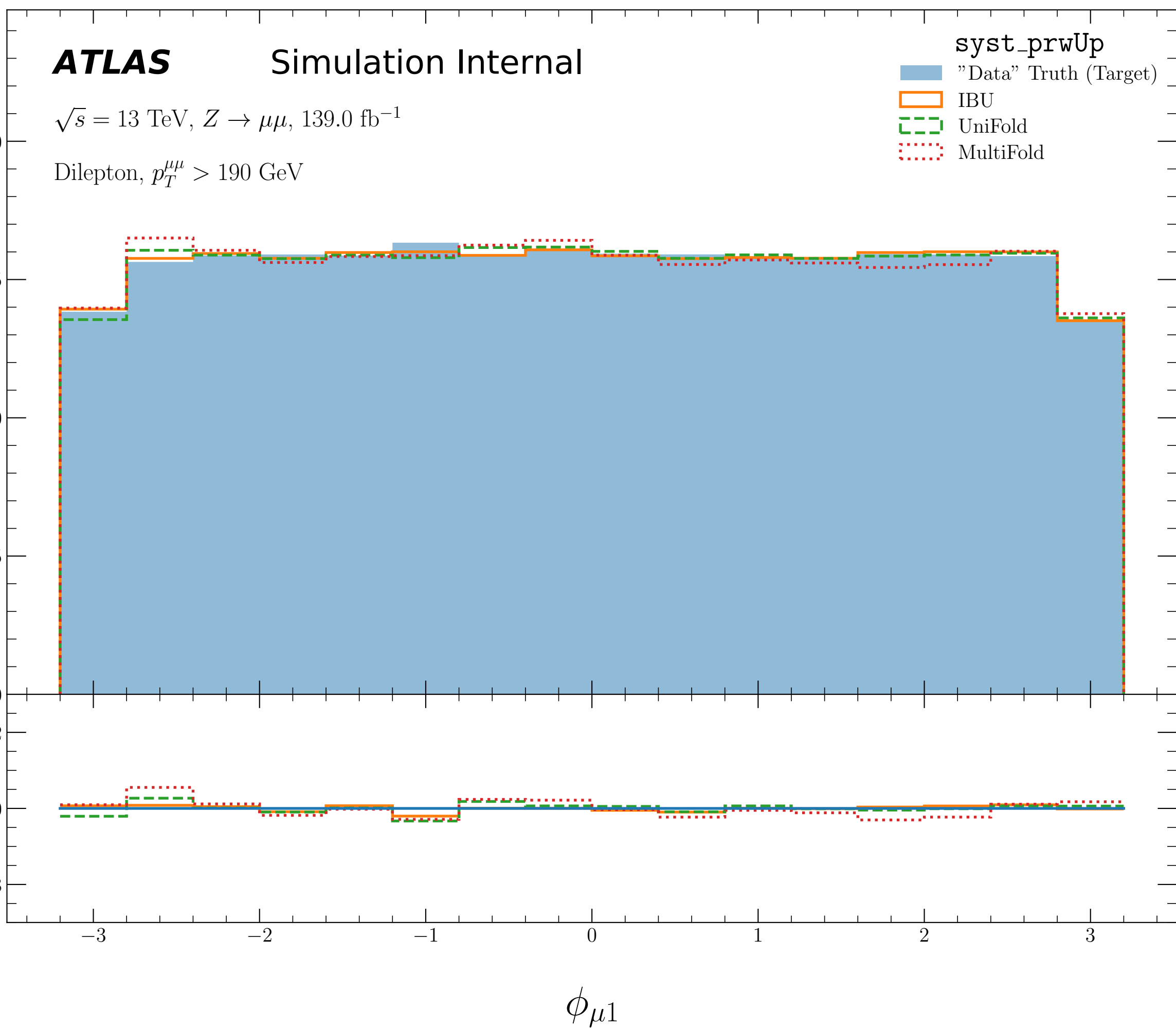
0

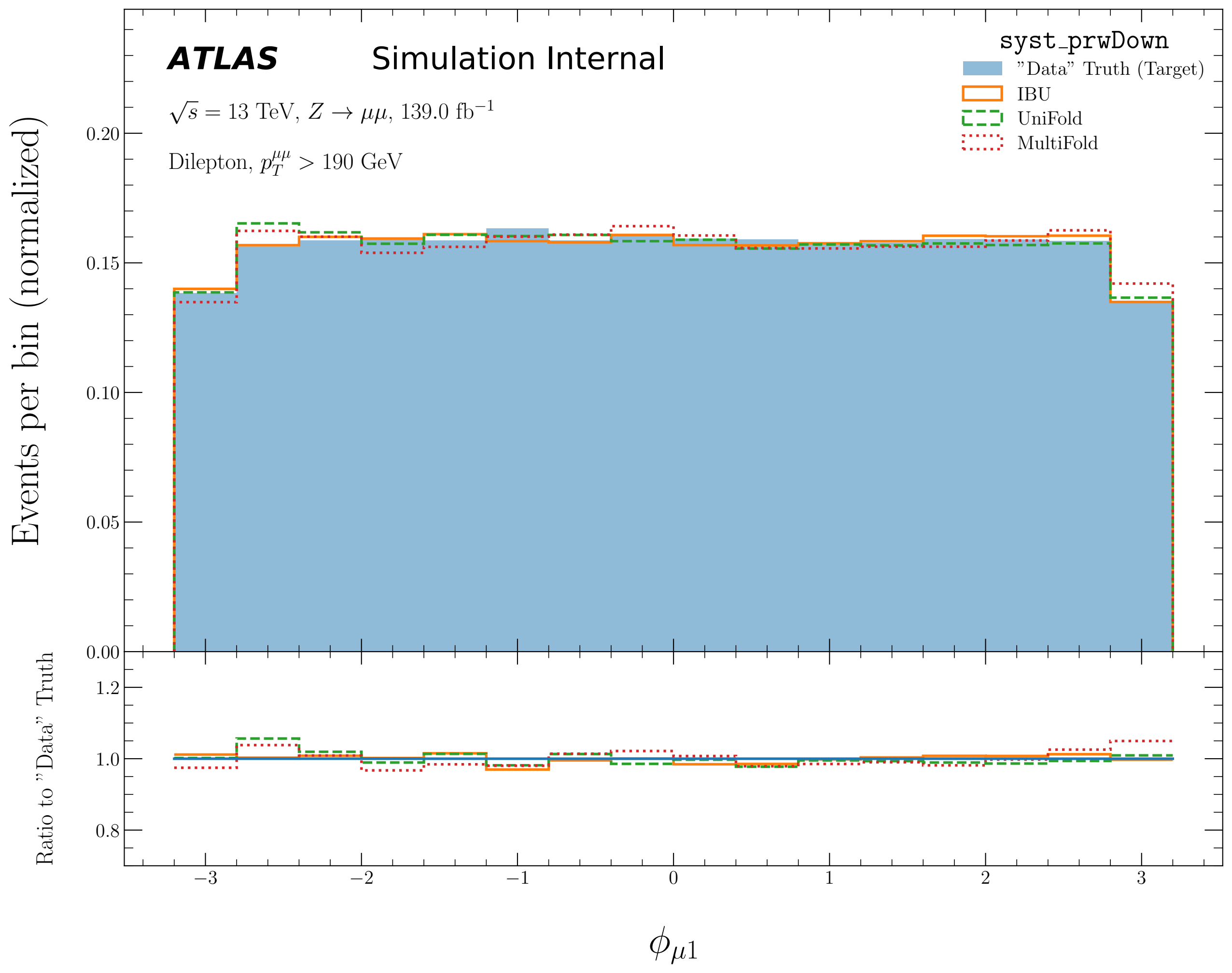
1

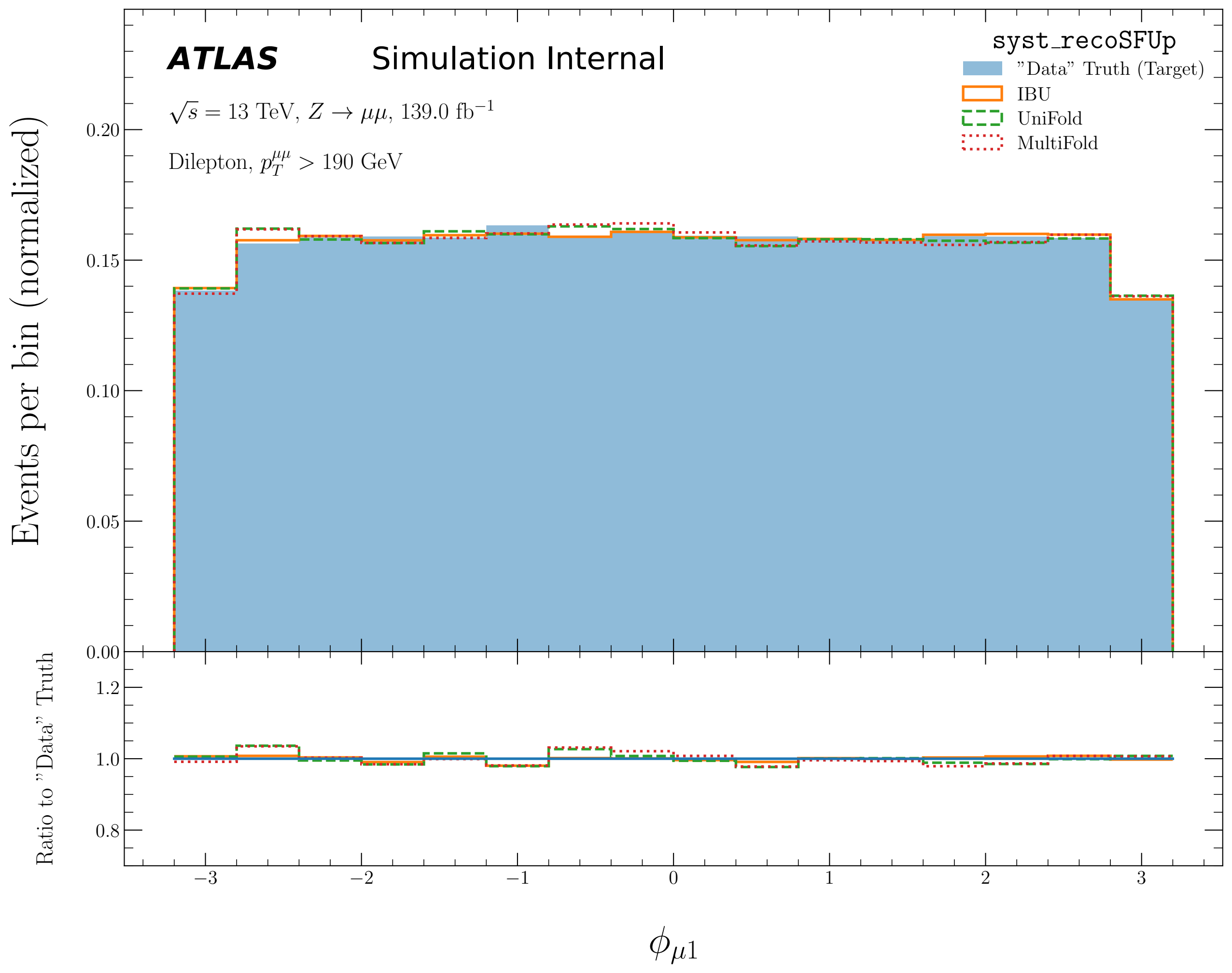
2

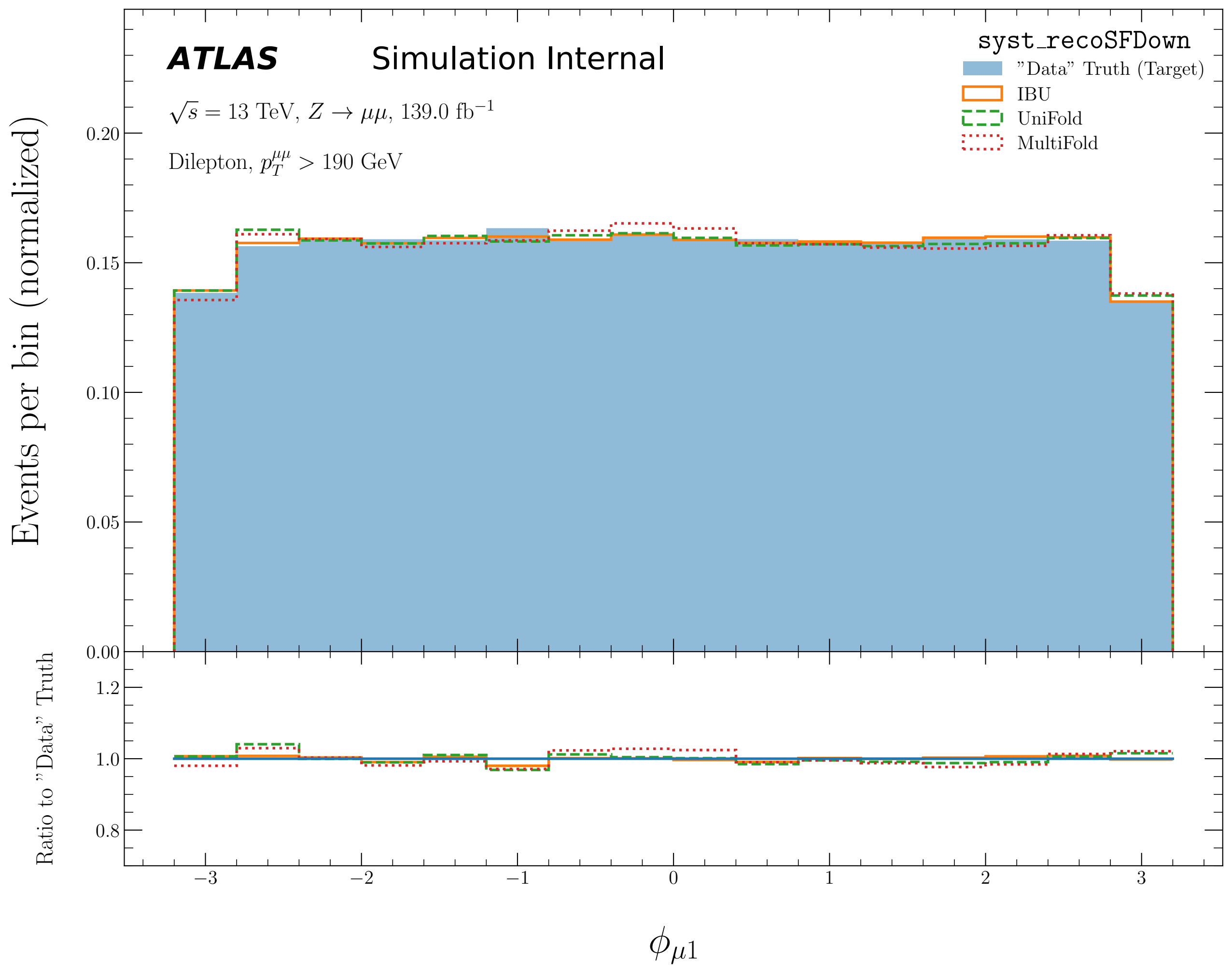
3

$\phi_{\mu 1}$

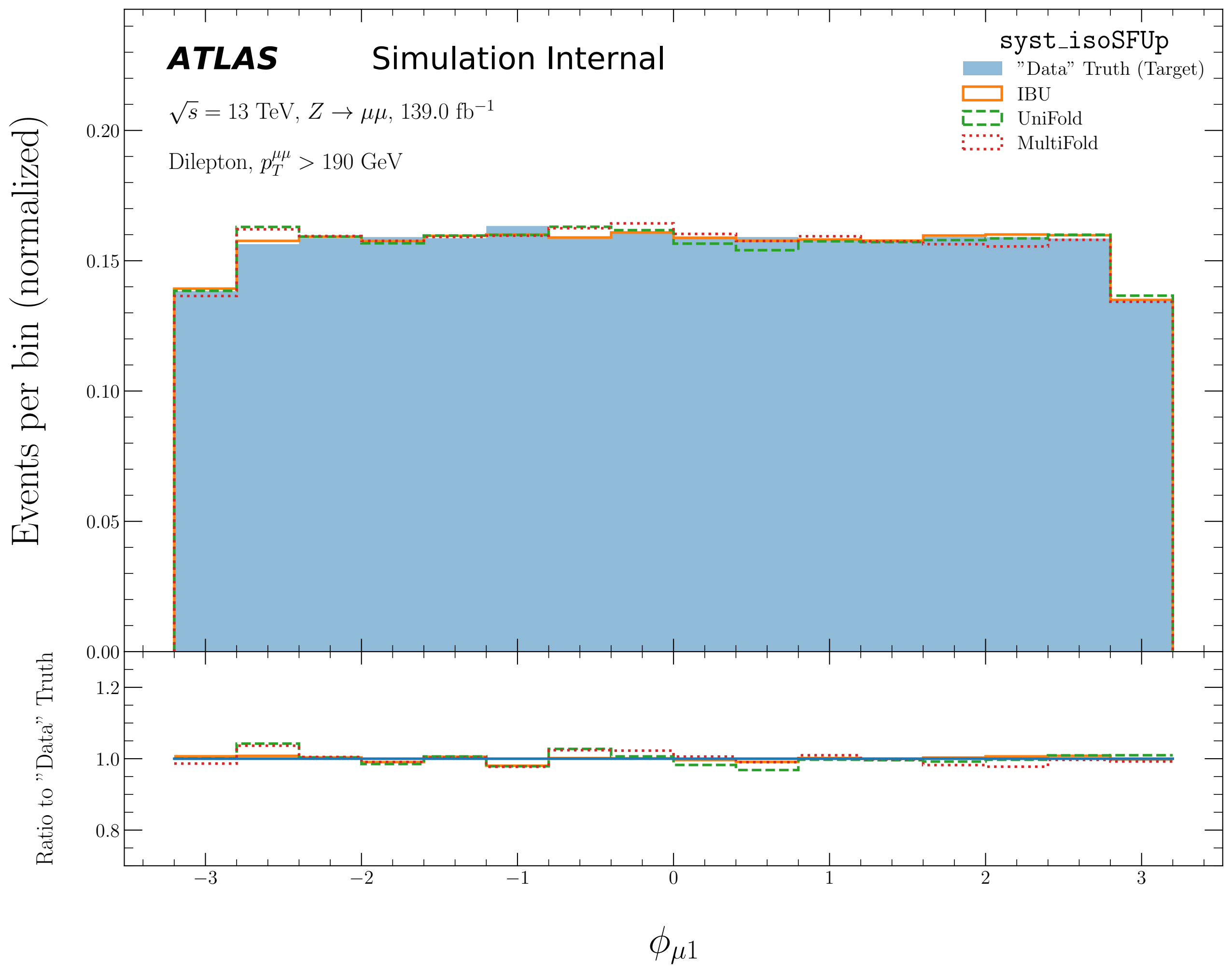


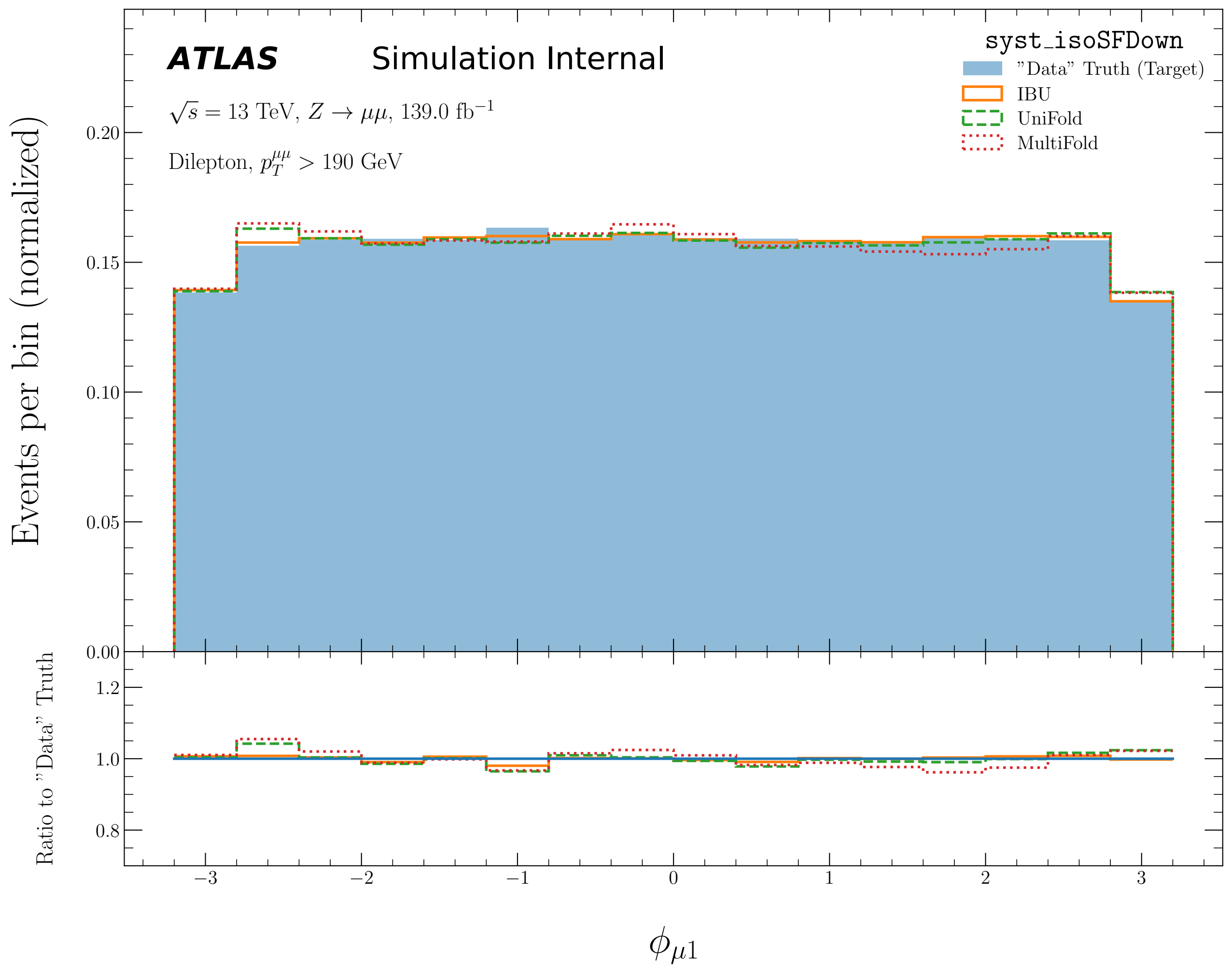


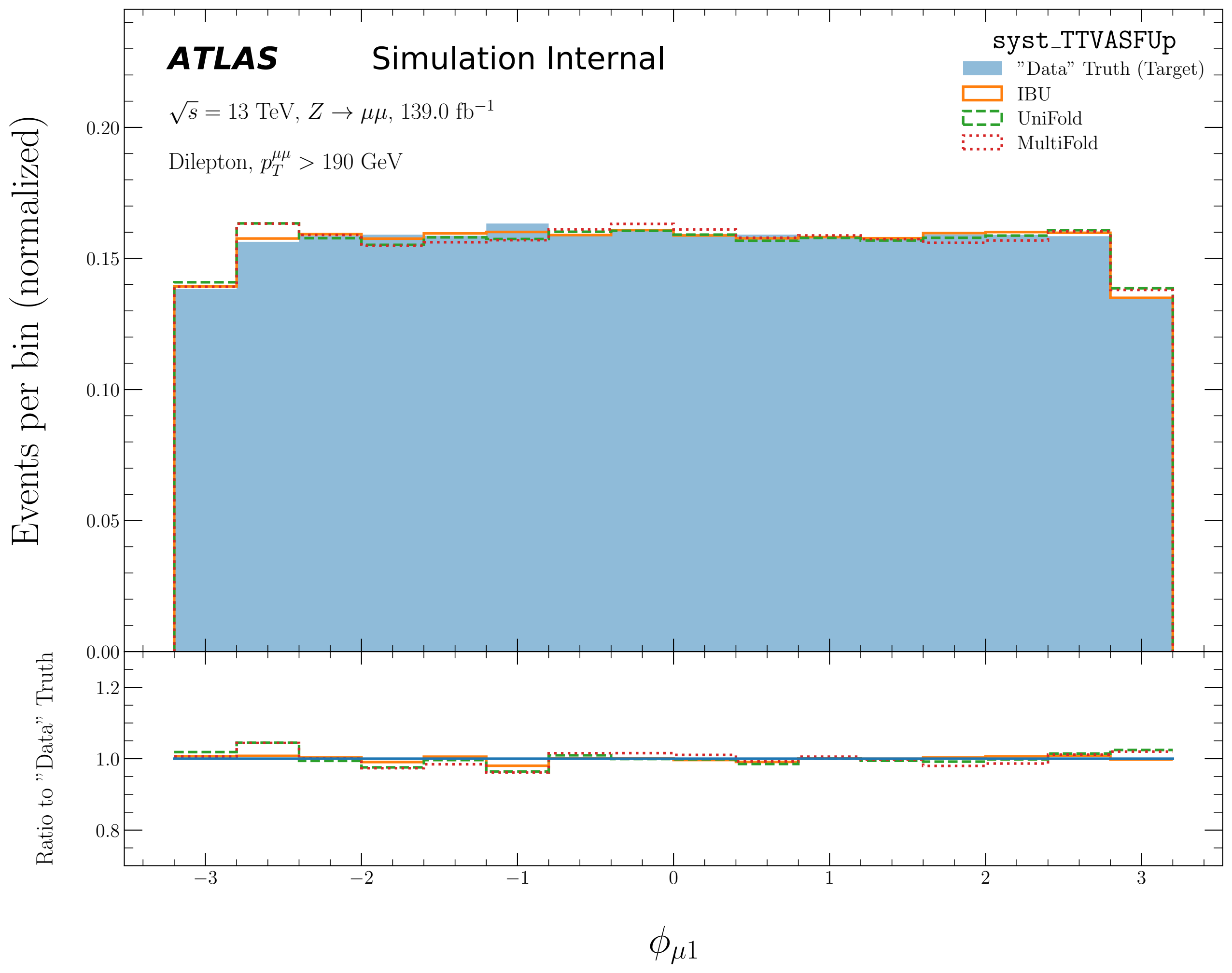


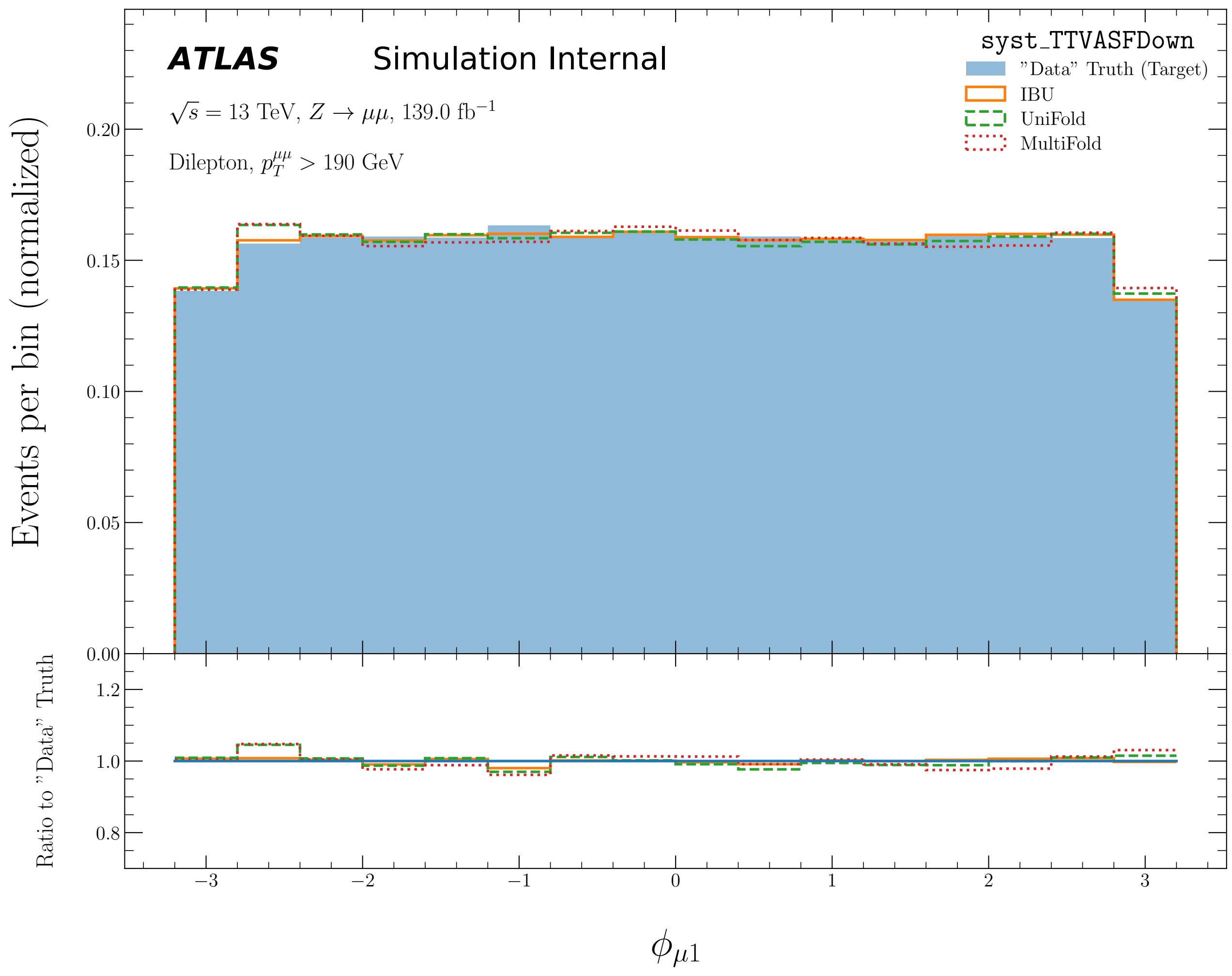












Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_trigSFUp

- "Data" Truth (Target)
- IBU
- UniFold
- MultiFold

0.20

0.15

0.10

0.05

0.00

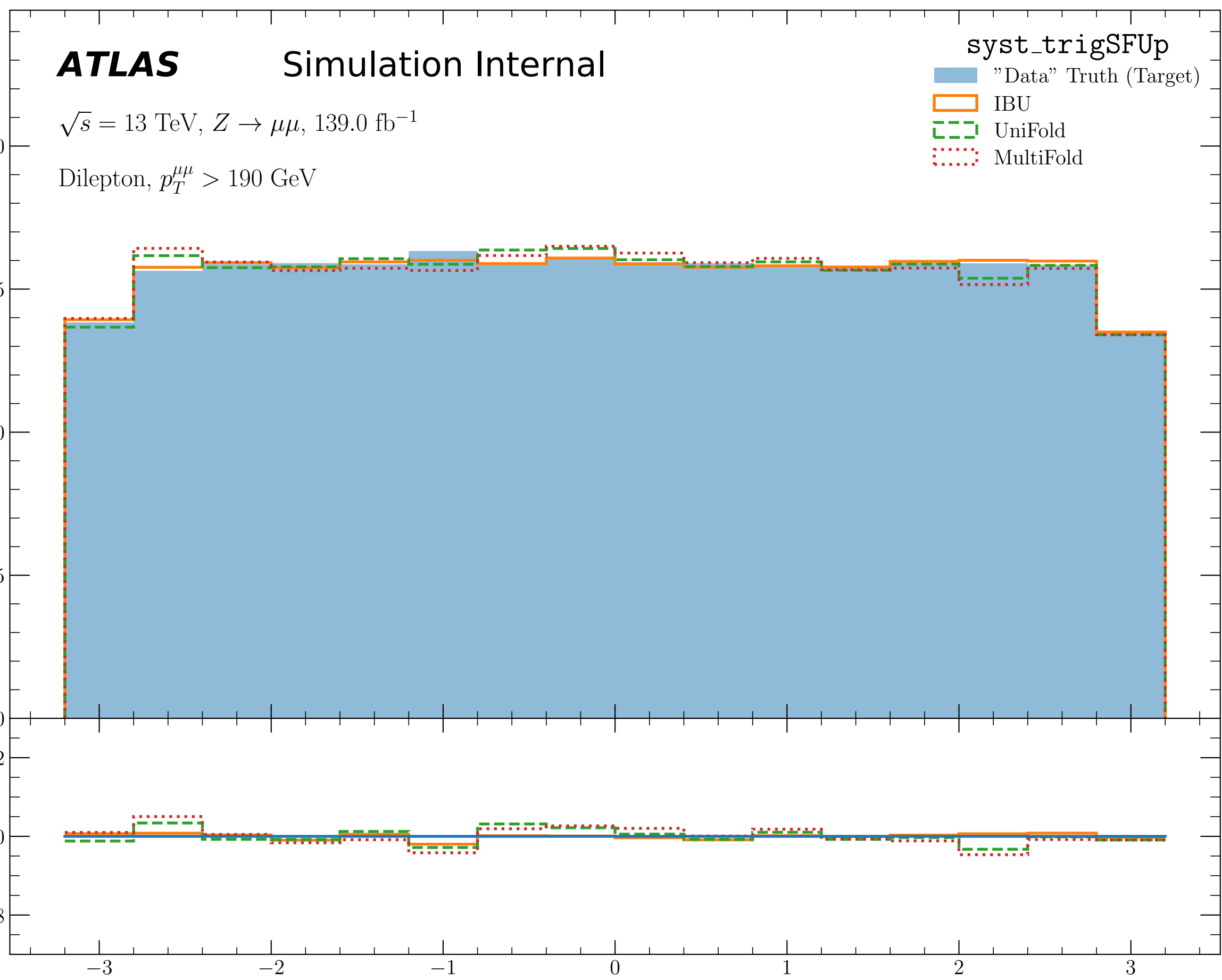
Ratio to "Data" Truth

1.2

1.0

0.8

$\phi_{\mu 1}$



Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_trigSFDown

"Data" Truth (Target)

IBU

UniFold

MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

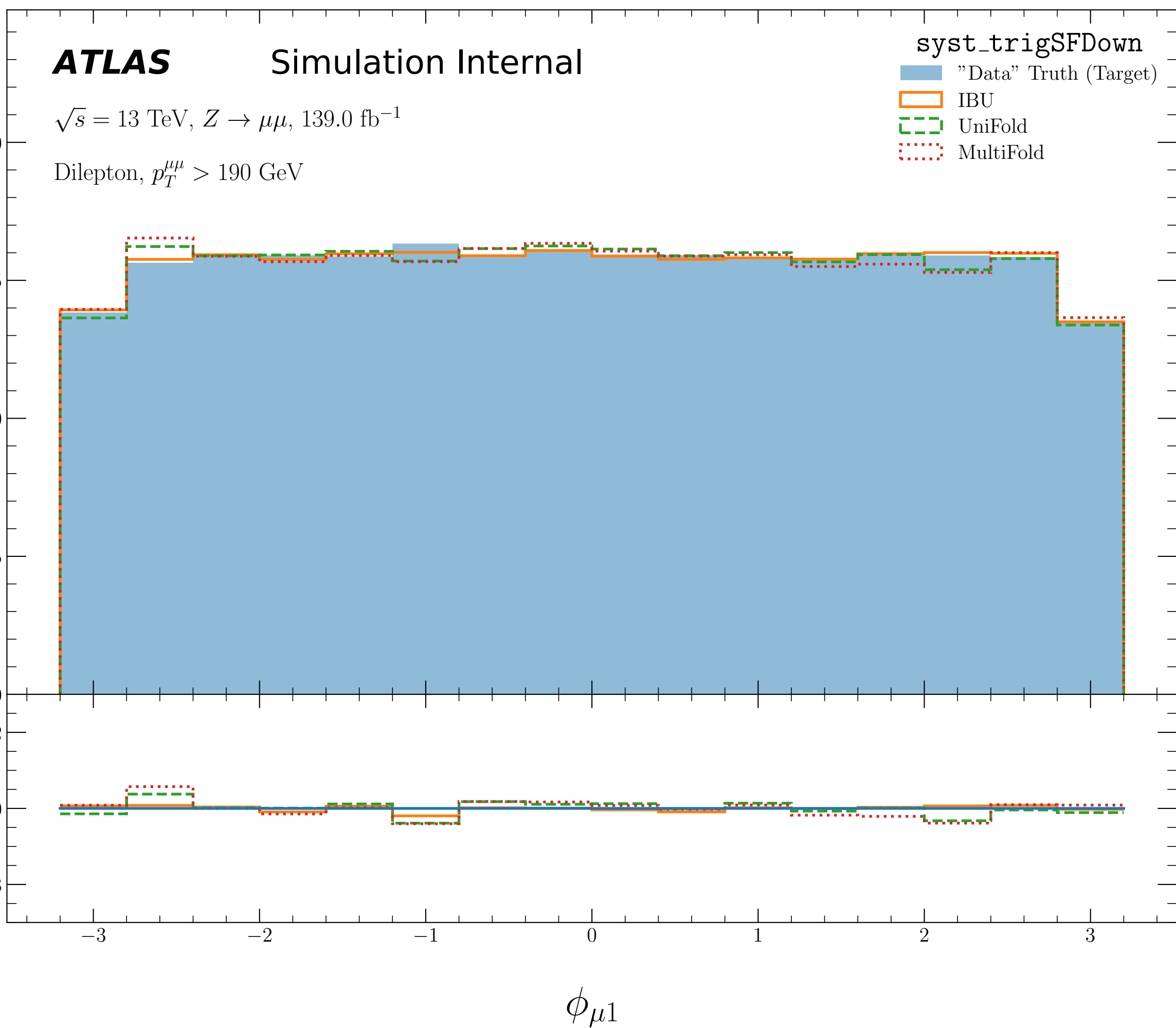
0

1

2

3

$\phi_{\mu 1}$



Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_prwUp

- "Data" Truth (Target)
- IBU
- UniFold
- MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

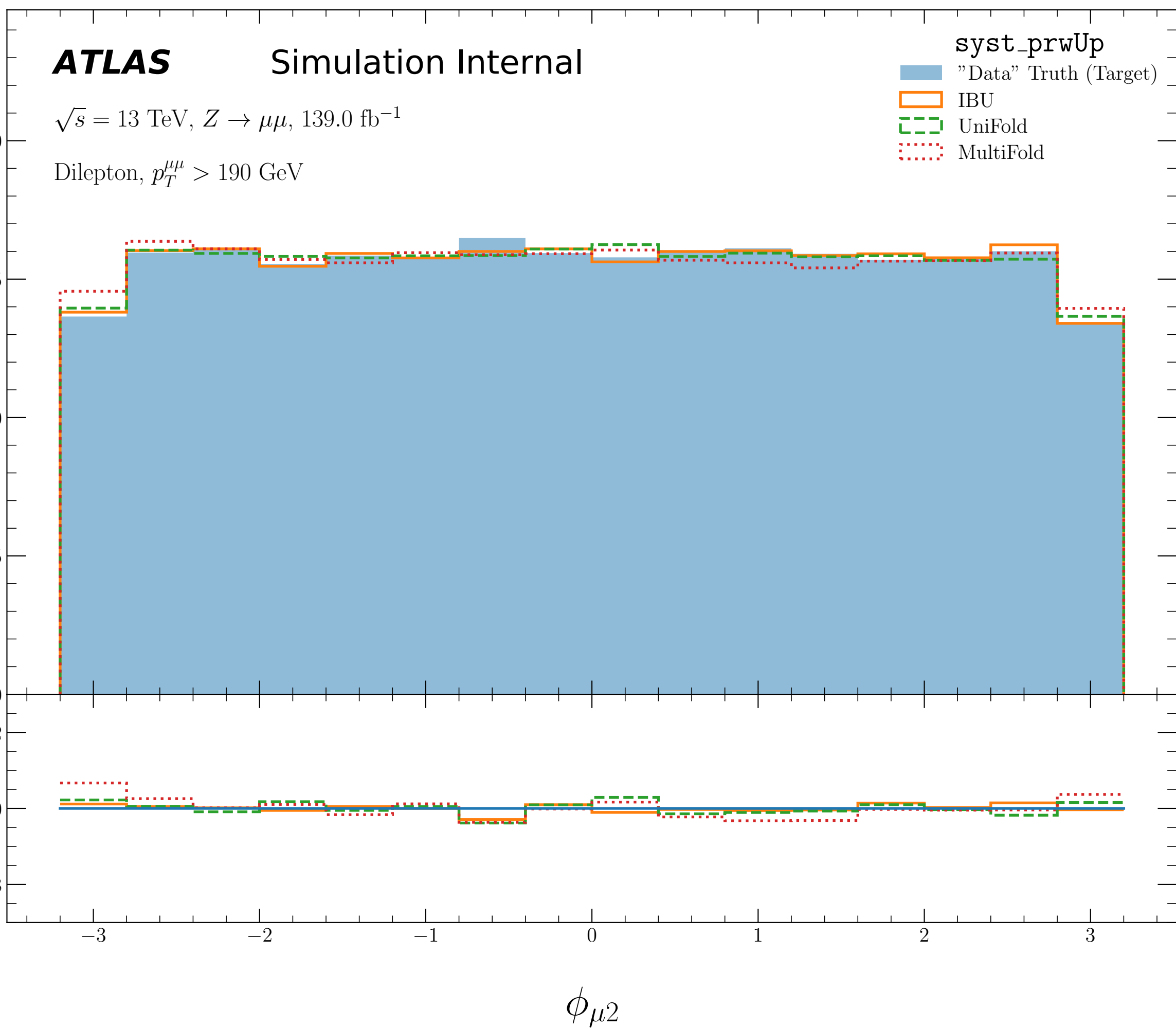
0

1

2

3

$\phi_{\mu 2}$



Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

sys\_prwDown

- "Data" Truth (Target)
- IBU
- UniFold
- MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

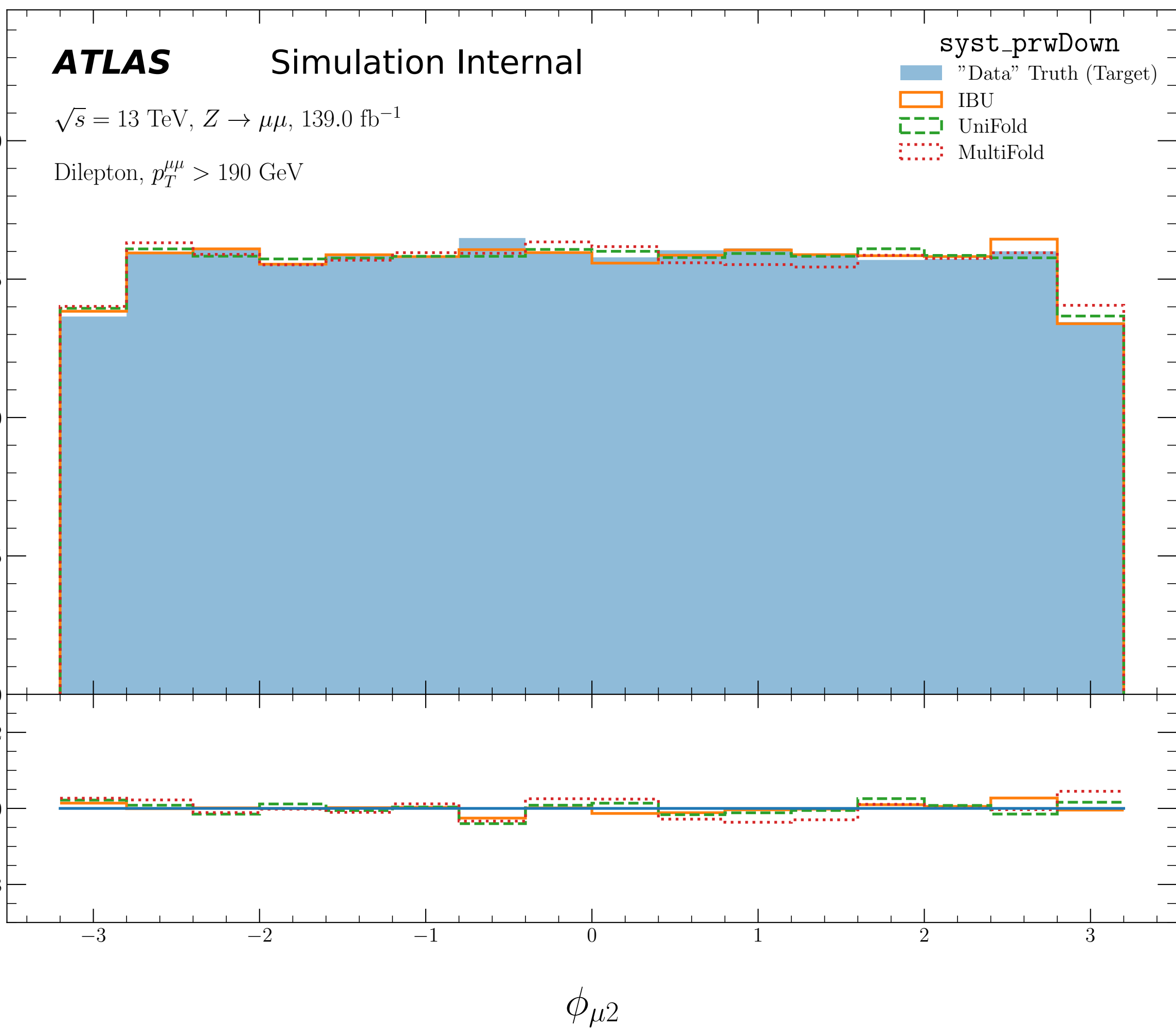
0

1

2

3

$\phi_{\mu 2}$





Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_recoSFUp

- "Data" Truth (Target)
- IBU
- UniFold
- MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

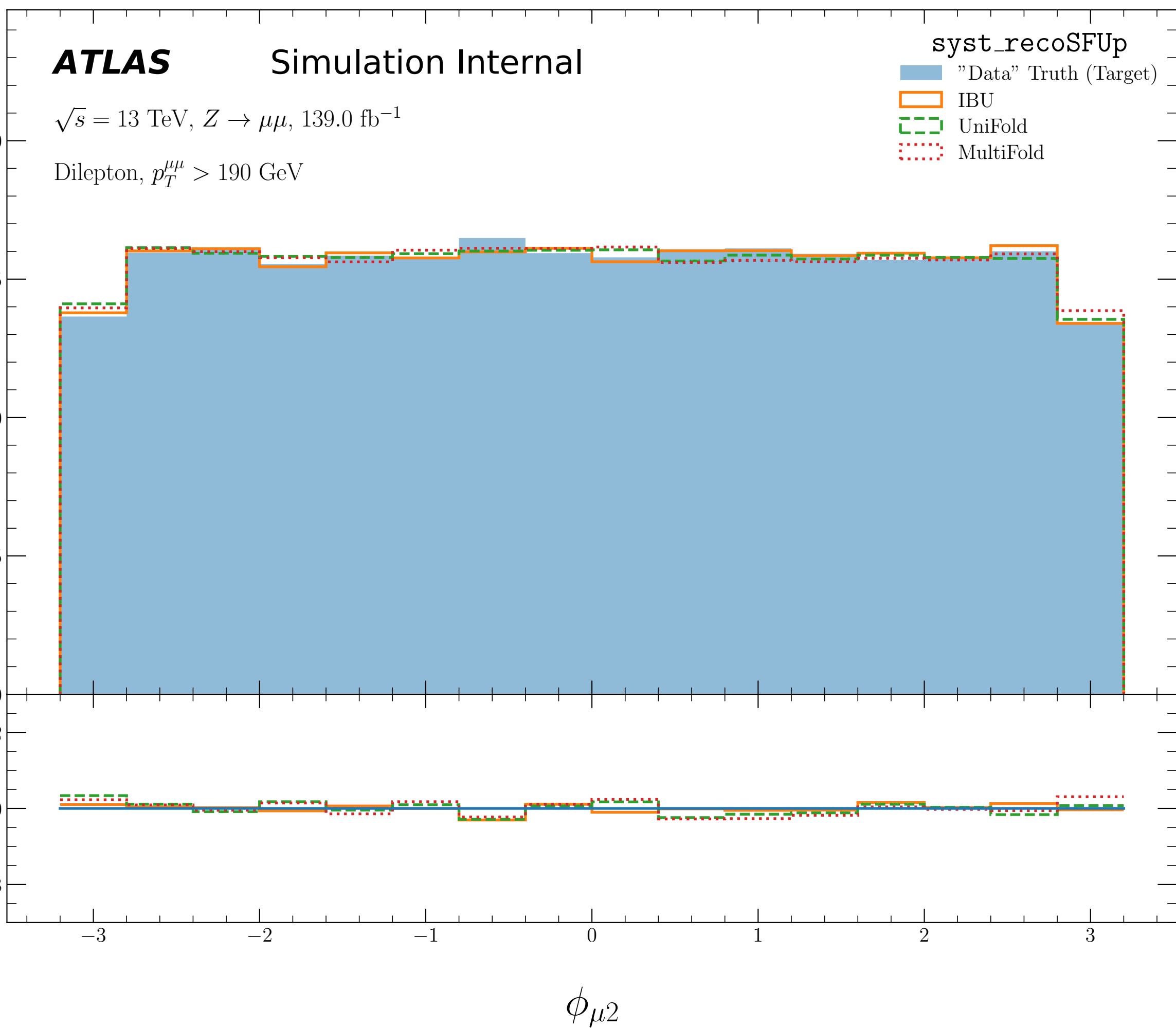
0

1

2

3

$\phi_{\mu 2}$



Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_recoSFDown

"Data" Truth (Target)

IBU

UniFold

MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

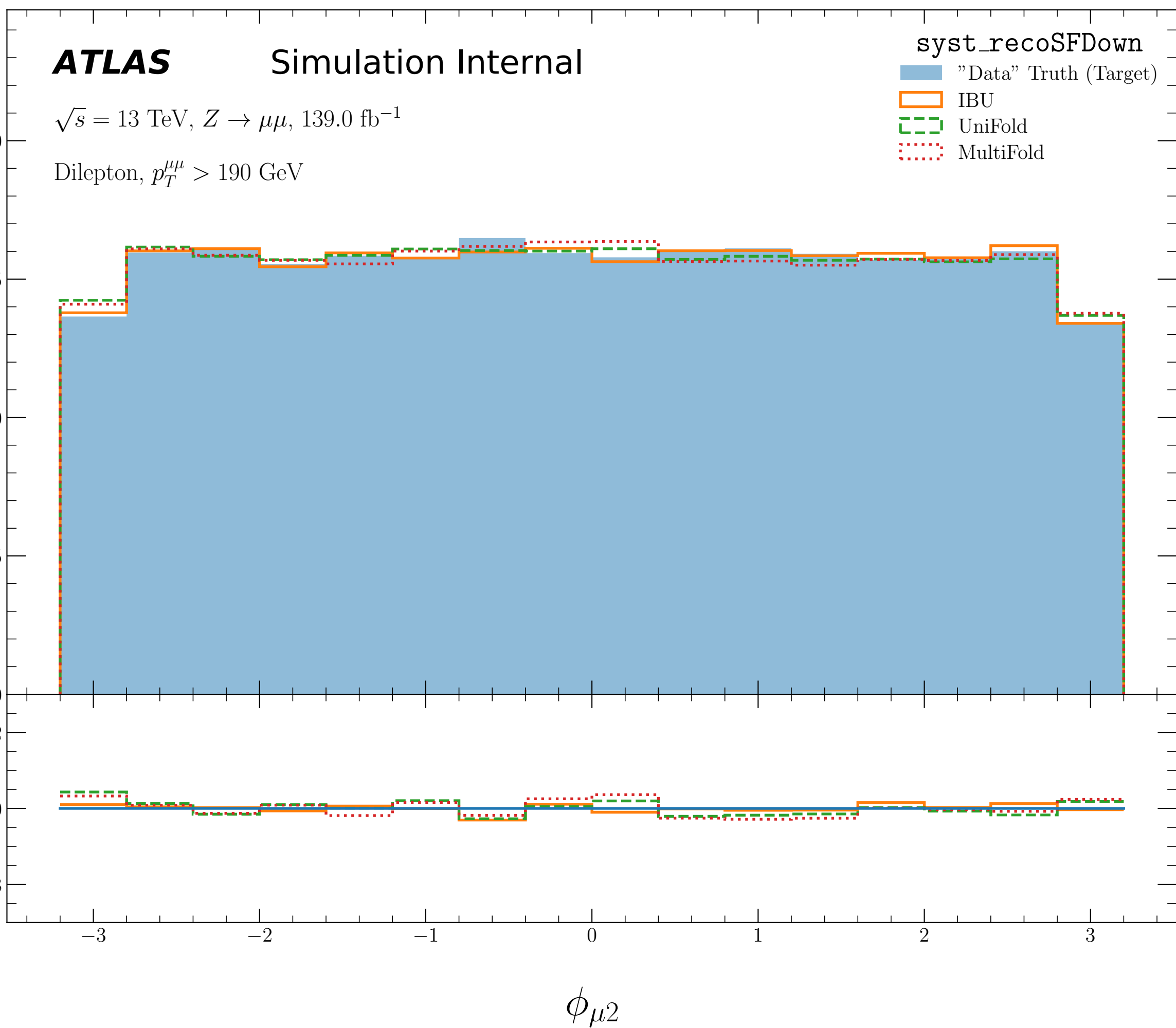
0

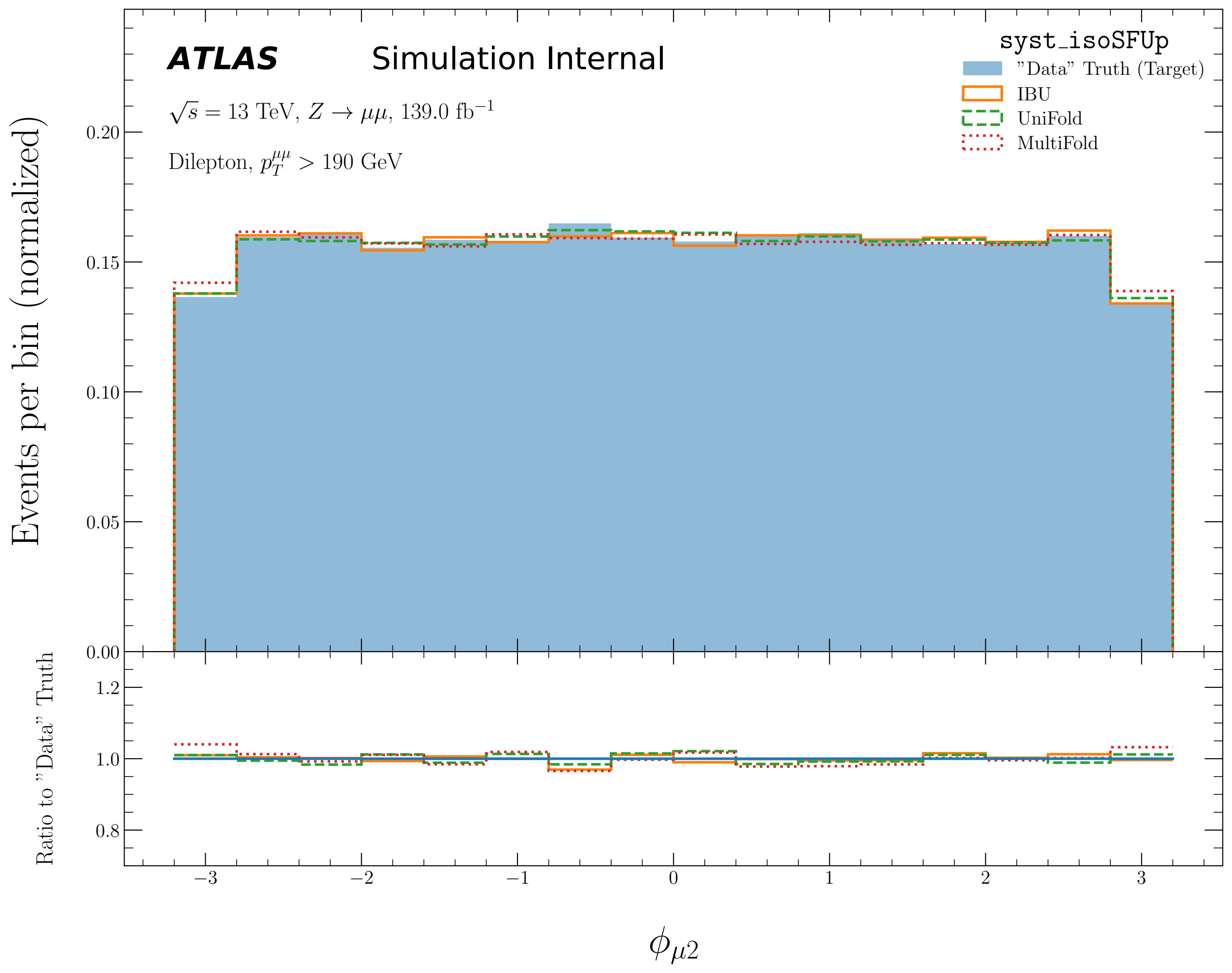
1

2

3

$\phi_{\mu 2}$





Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_isoSFDown

"Data" Truth (Target)

IBU

UniFold

MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

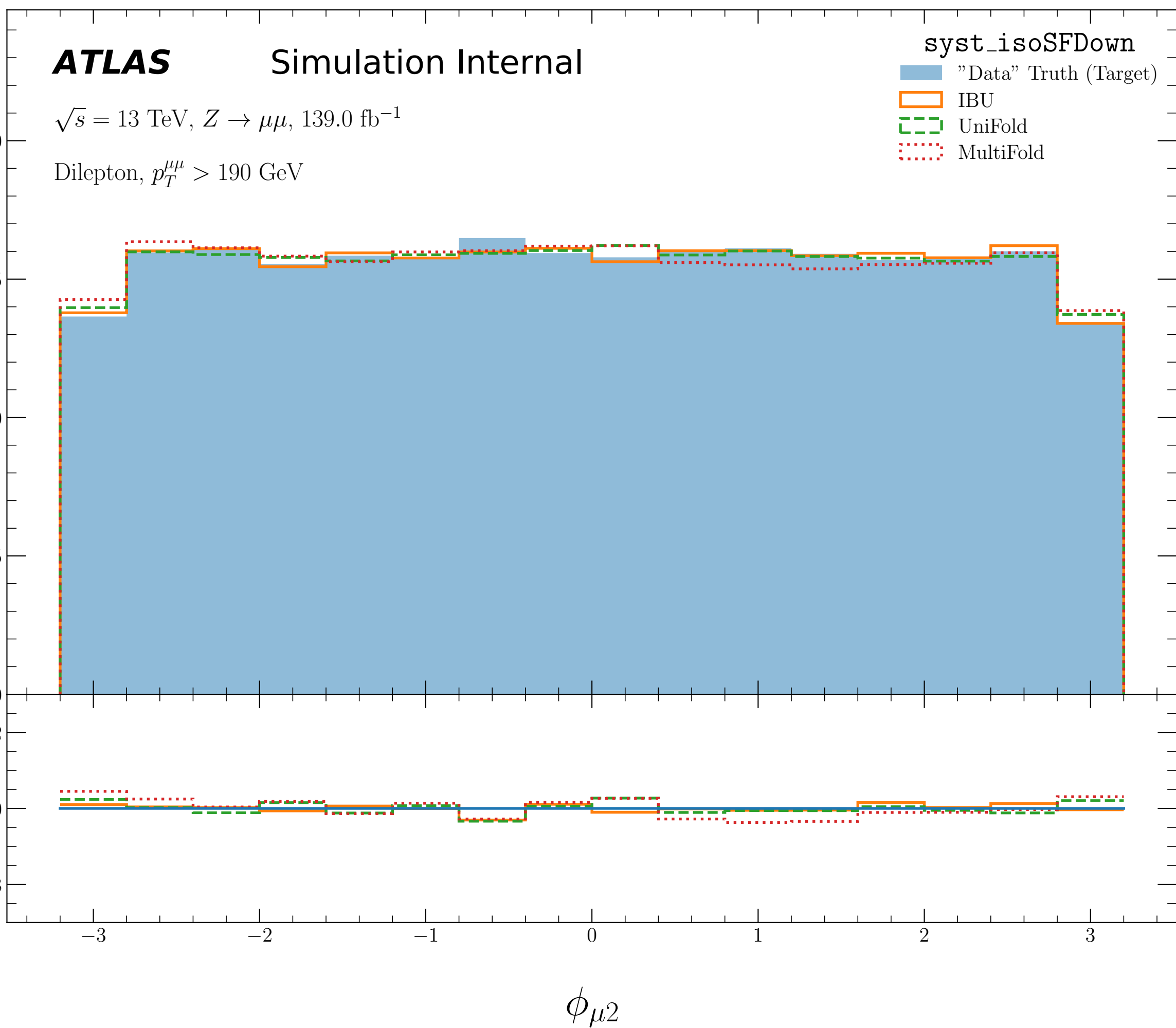
0

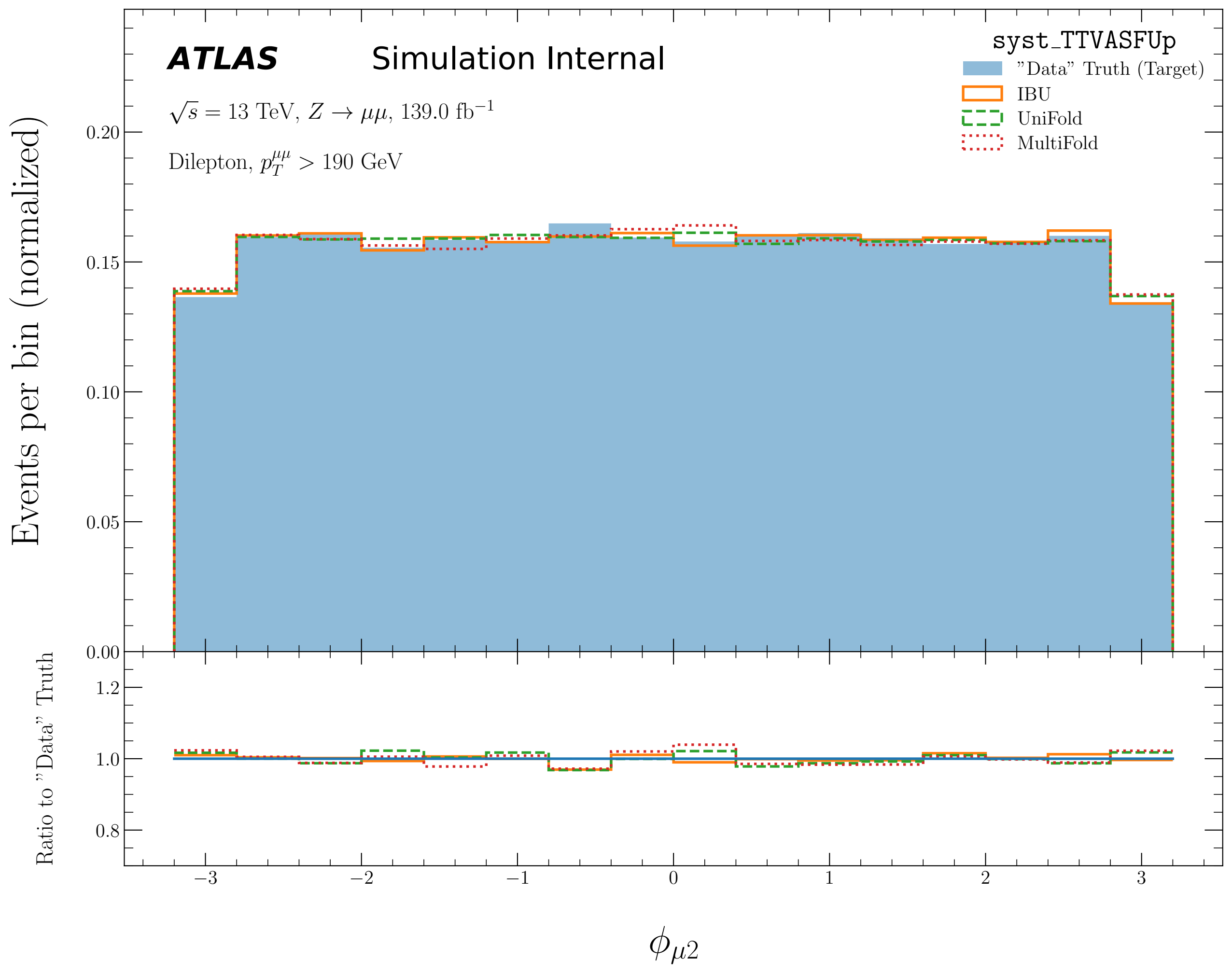
1

2

3

$\phi_{\mu 2}$





Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_TTVASFDown

"Data" Truth (Target)

IBU

UniFold

MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

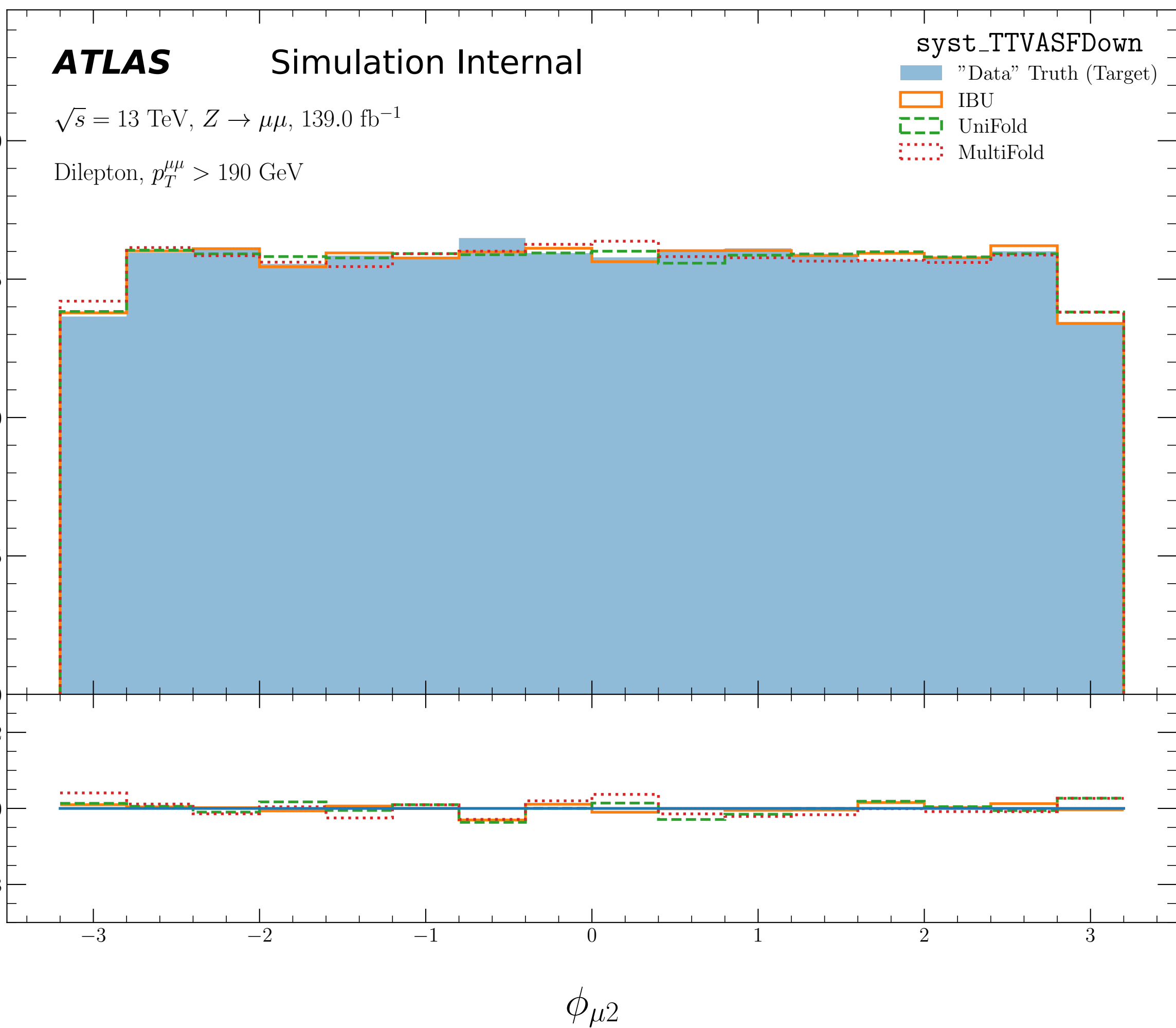
0

1

2

3

$\phi_{\mu 2}$



Events per bin (normalized)

**ATLAS**

Simulation Internal

$\sqrt{s} = 13 \text{ TeV}, Z \rightarrow \mu\mu, 139.0 \text{ fb}^{-1}$

Dilepton,  $p_T^{\mu\mu} > 190 \text{ GeV}$

syst\_trigSFUp

"Data" Truth (Target)

IBU

UniFold

MultiFold

0.20

0.15

0.10

0.05

0.00

Ratio to "Data" Truth

1.2

1.0

0.8

-3

-2

-1

0

1

2

3

$\phi_{\mu 2}$

