

ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

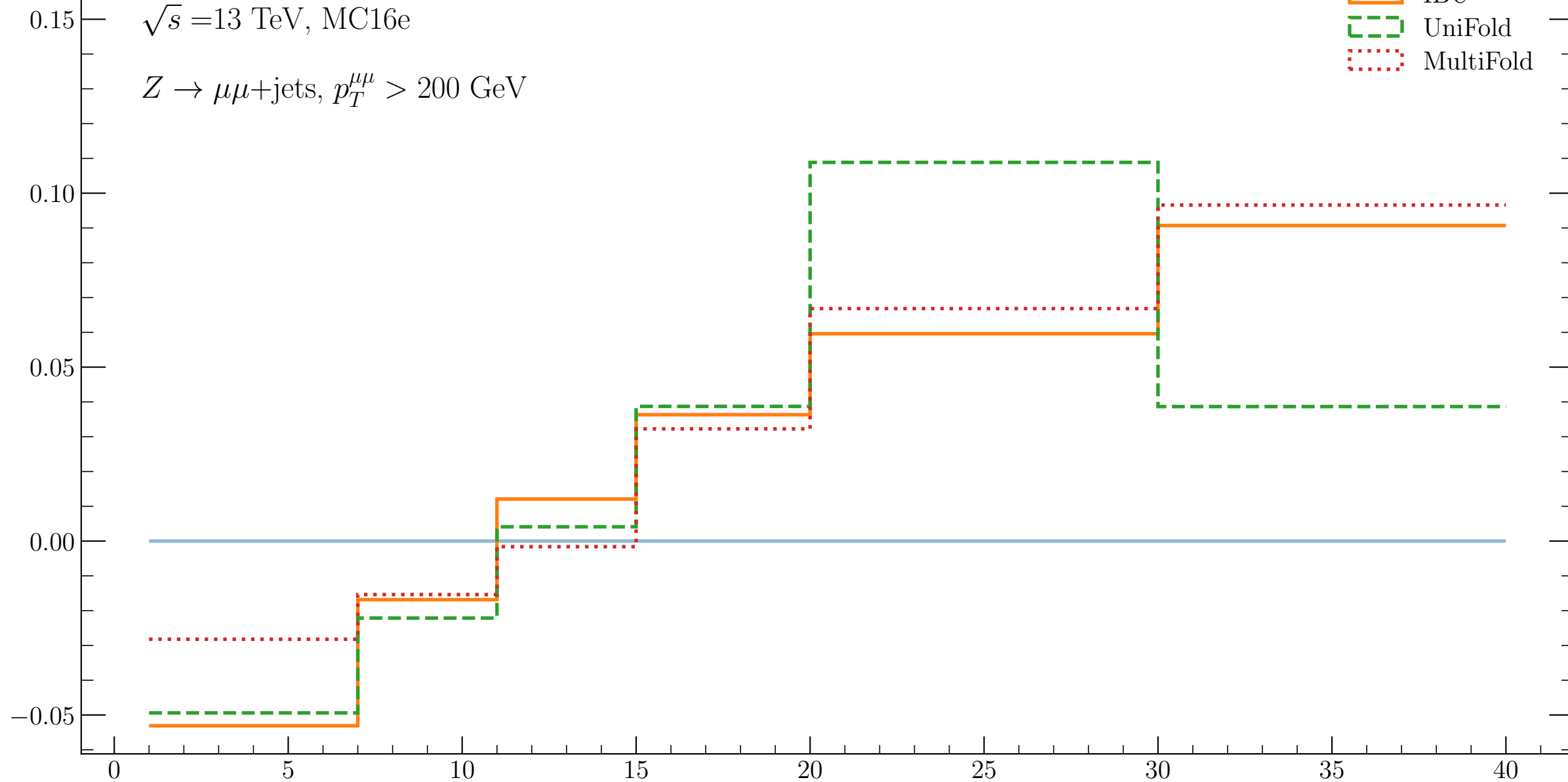
TrackFilter

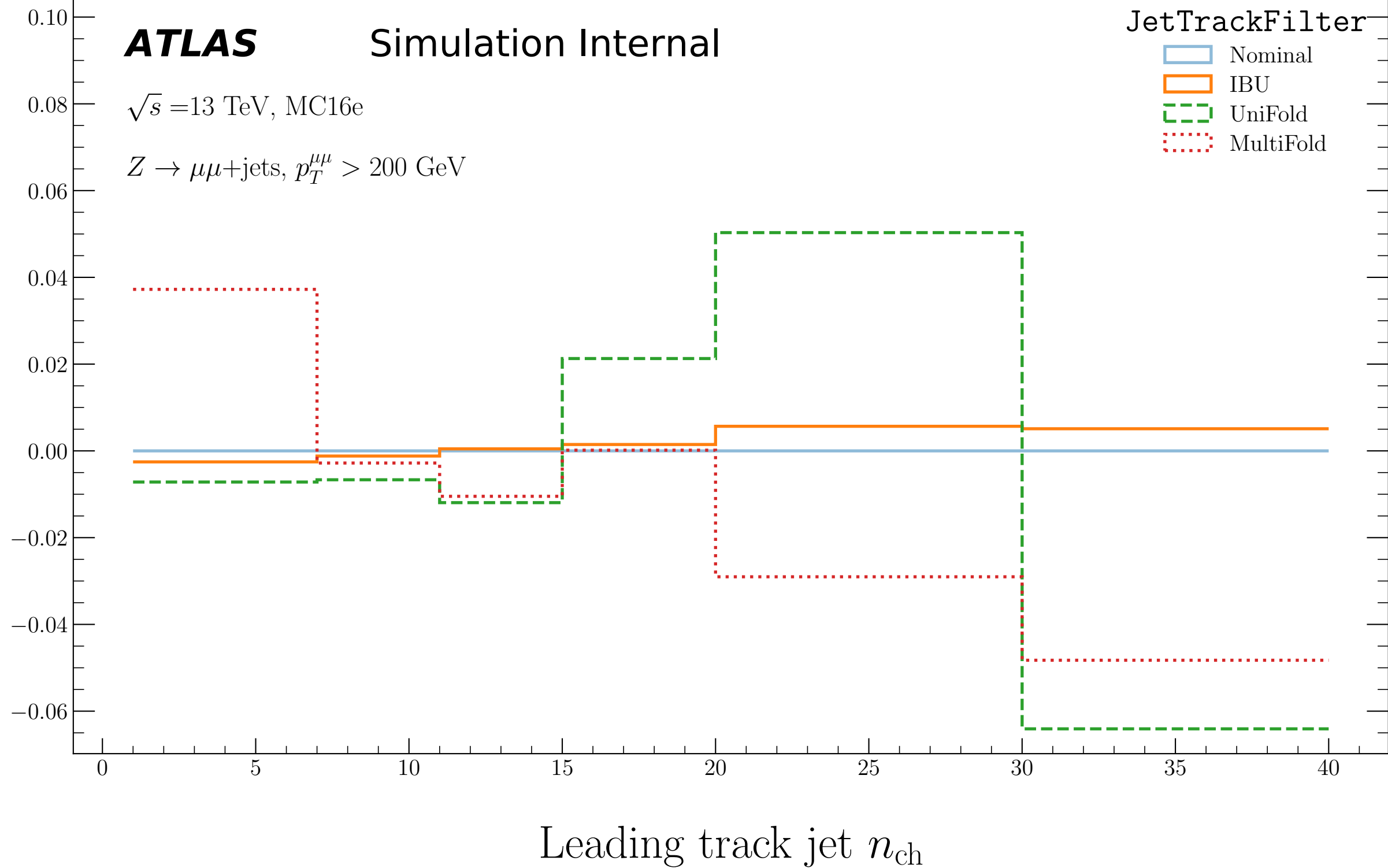
Nominal

IBU

UniFold

MultiFold

Leading track jet n_{ch}



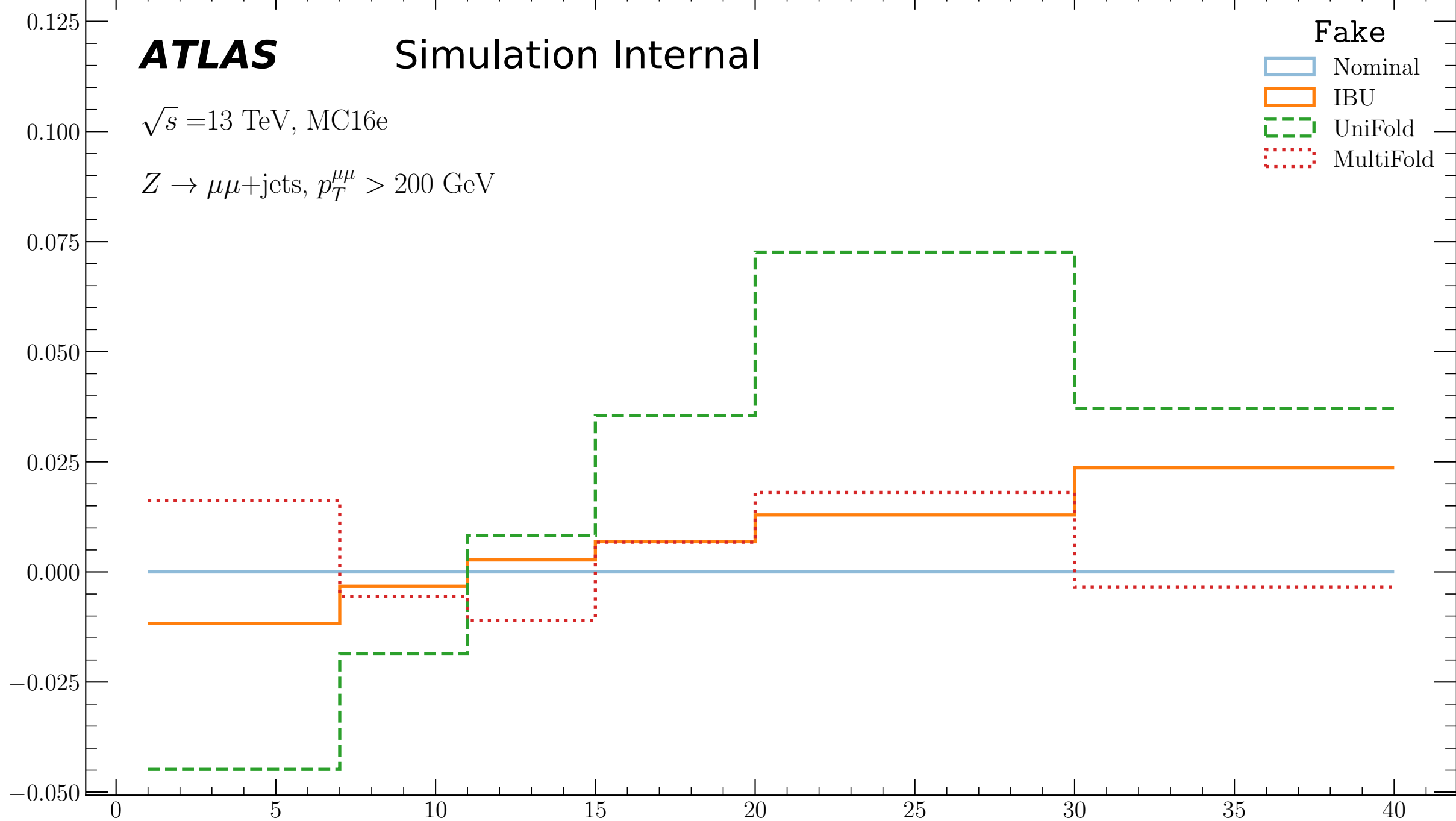
ATLAS

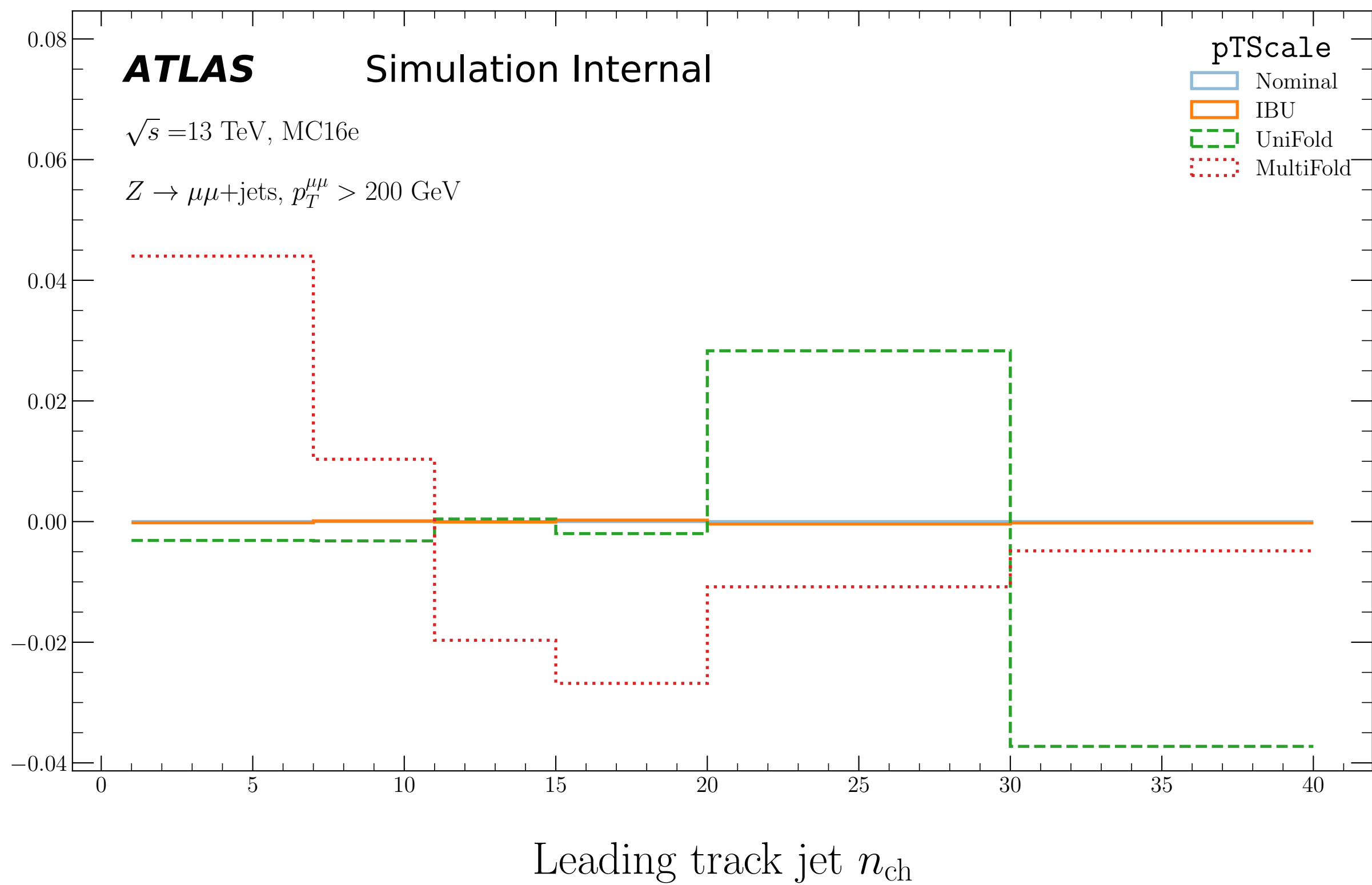
Simulation Internal

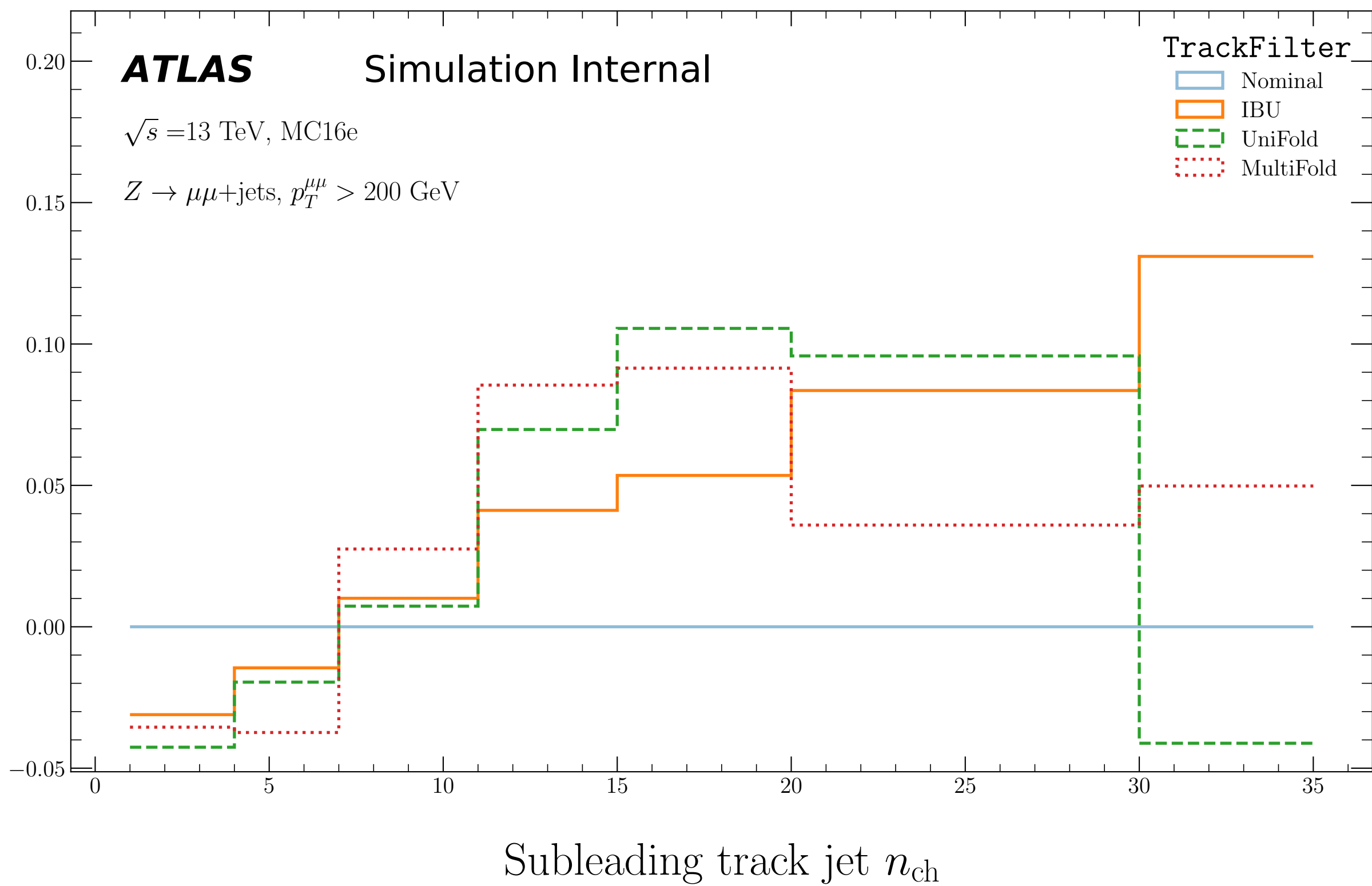
 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet n_{ch}





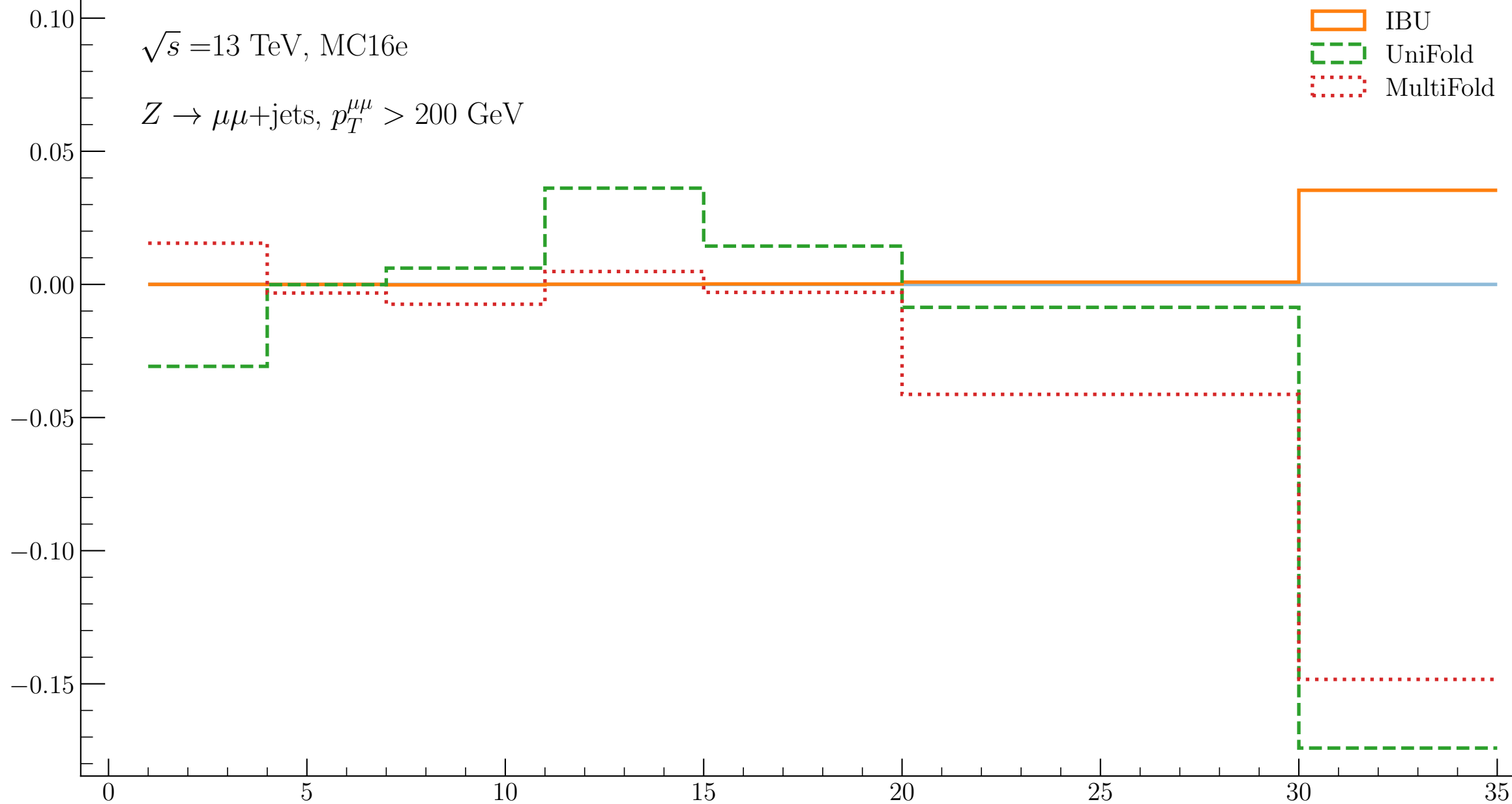
ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

- Nominal
- IBU
- UniFold
- MultiFold

Subleading track jet n_{ch}

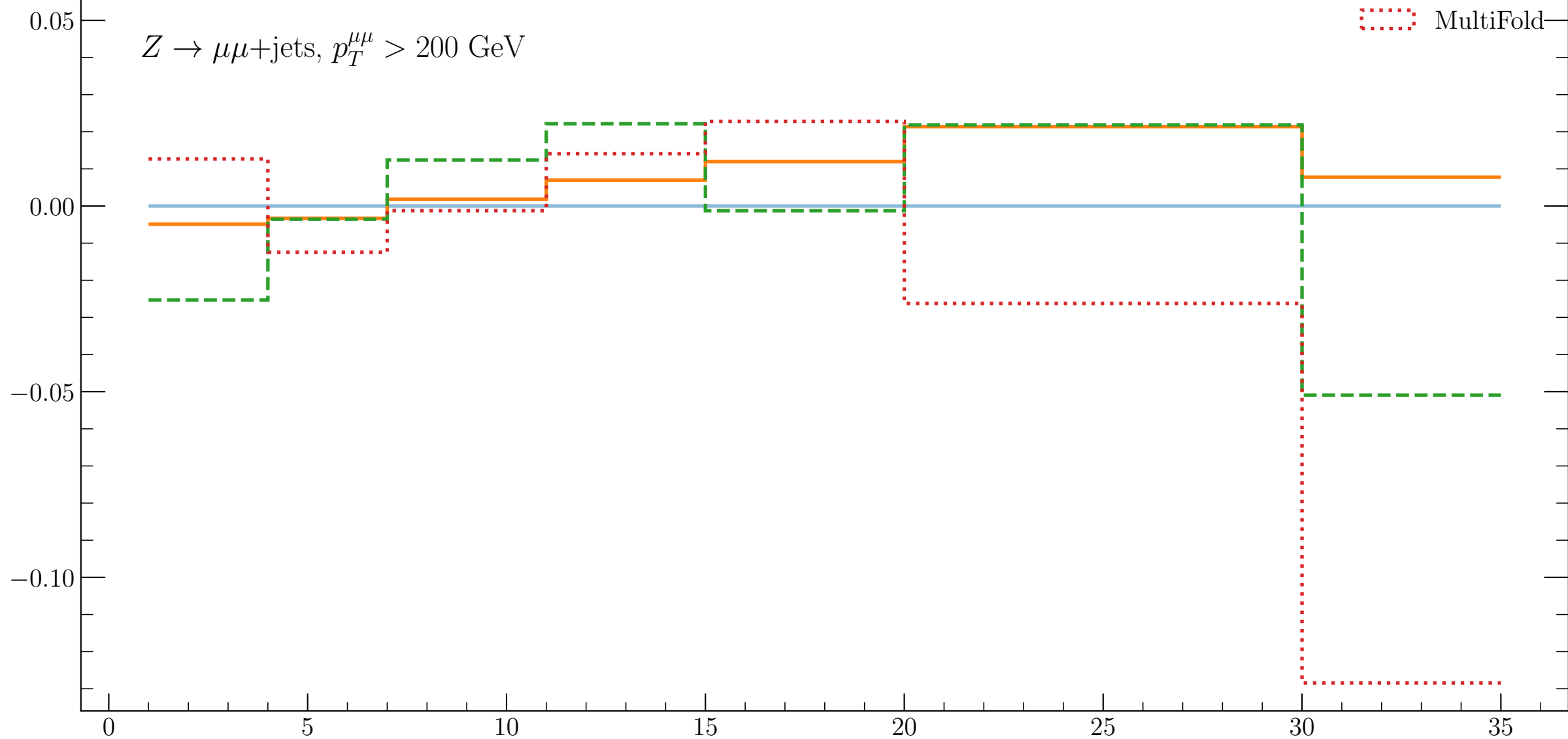
ATLAS

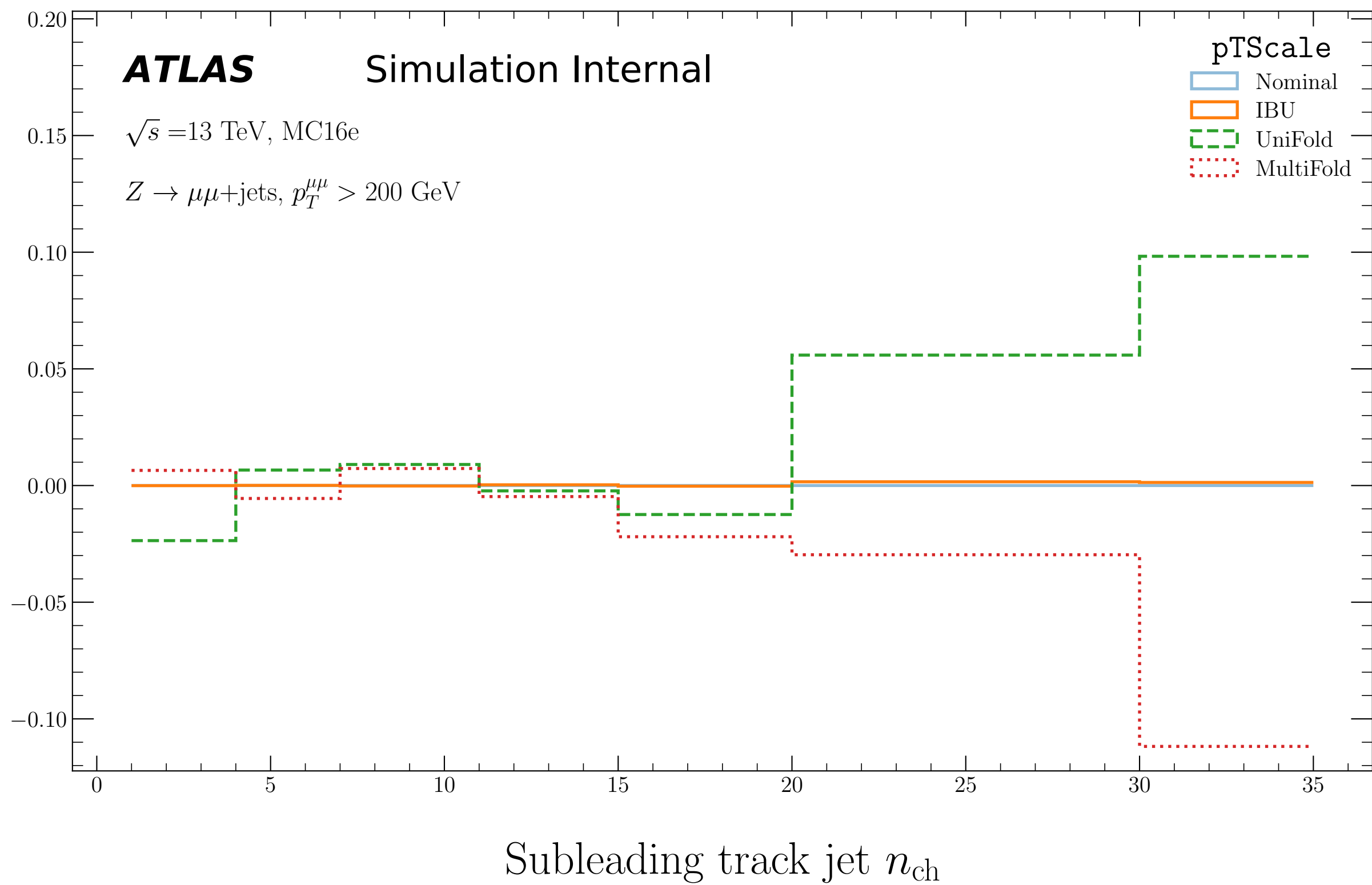
Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold

Subleading track jet n_{ch}



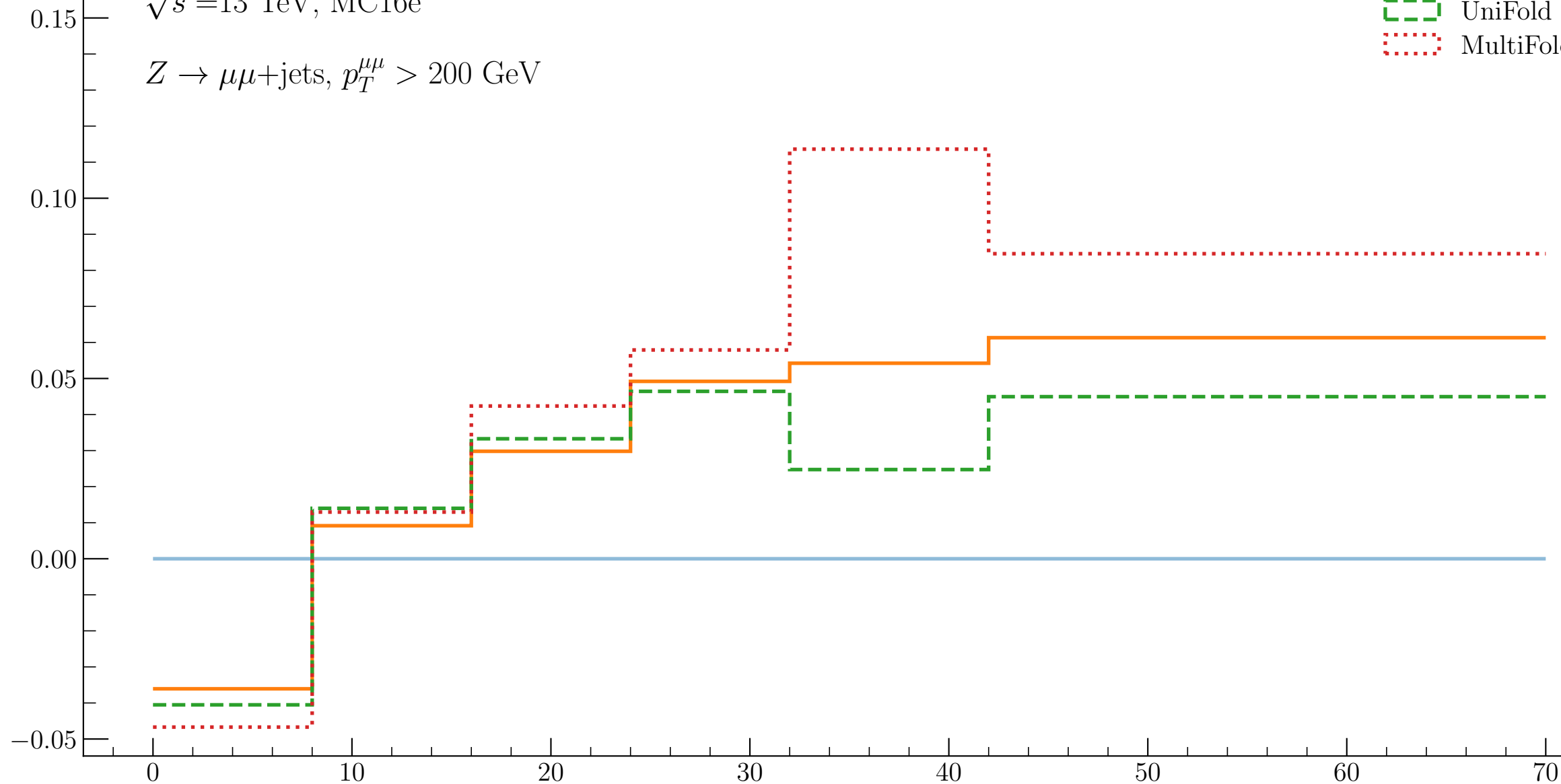
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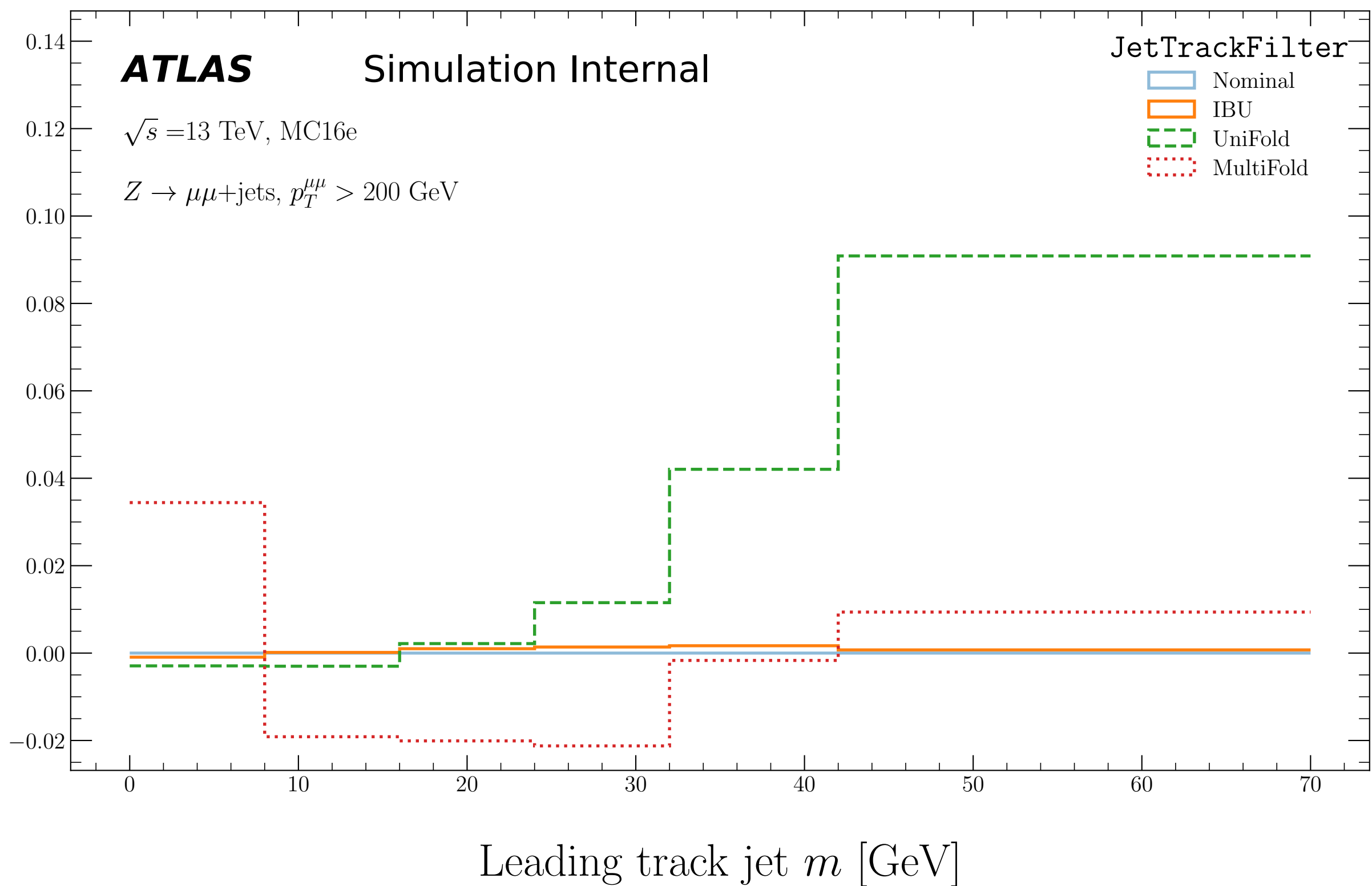
Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

TrackFilter

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet m [GeV]



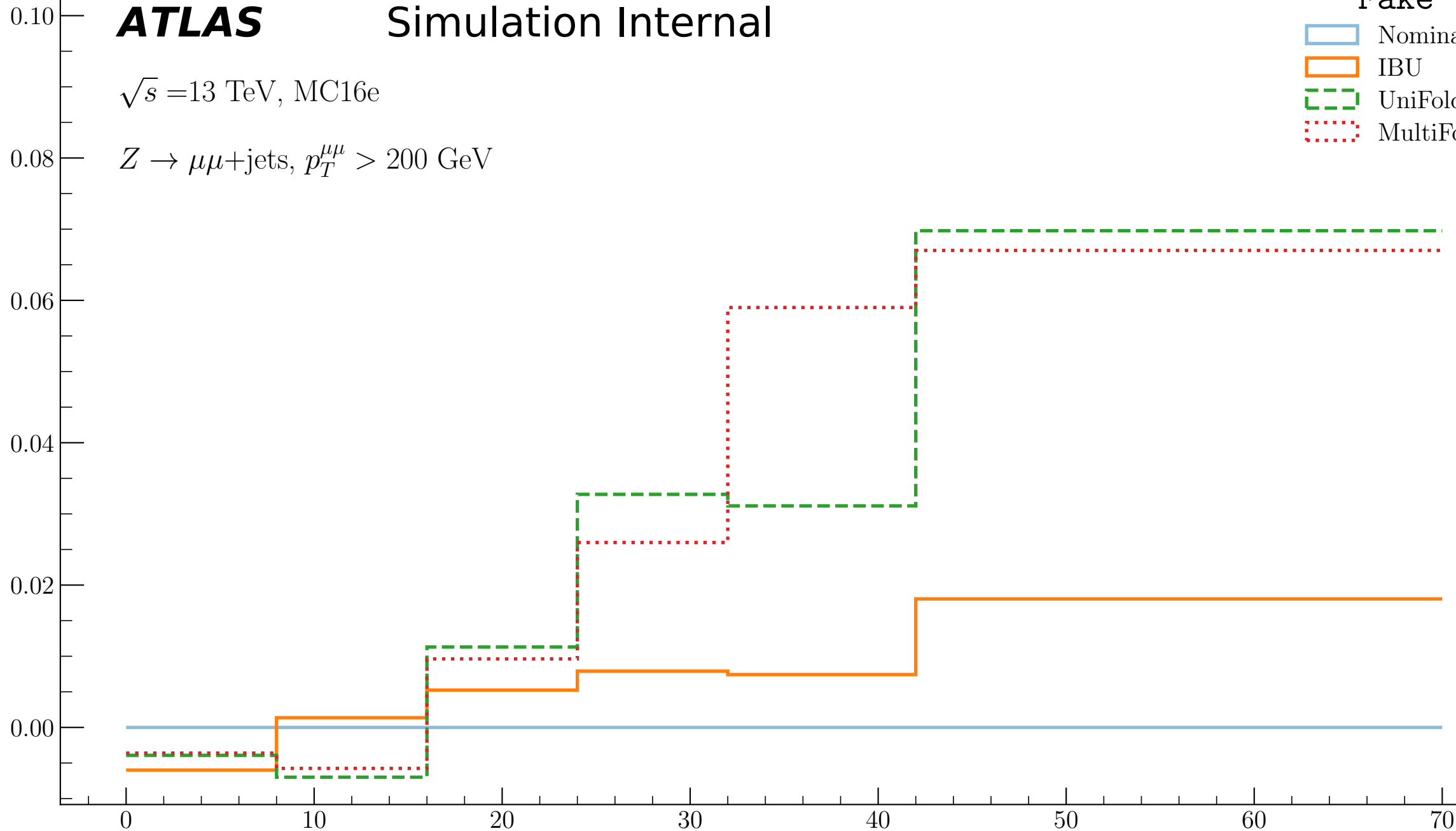
ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet m [GeV]

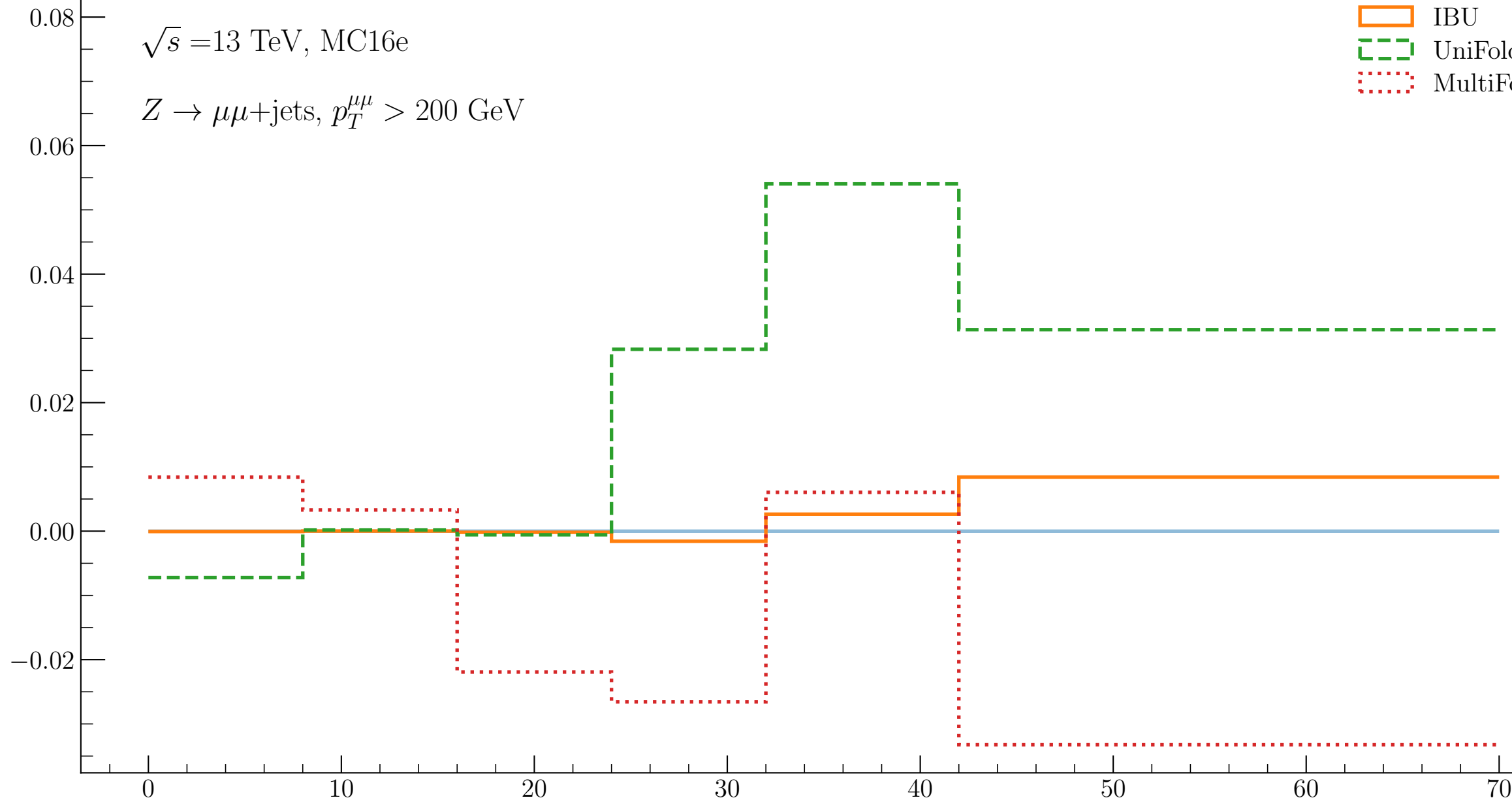
ATLAS

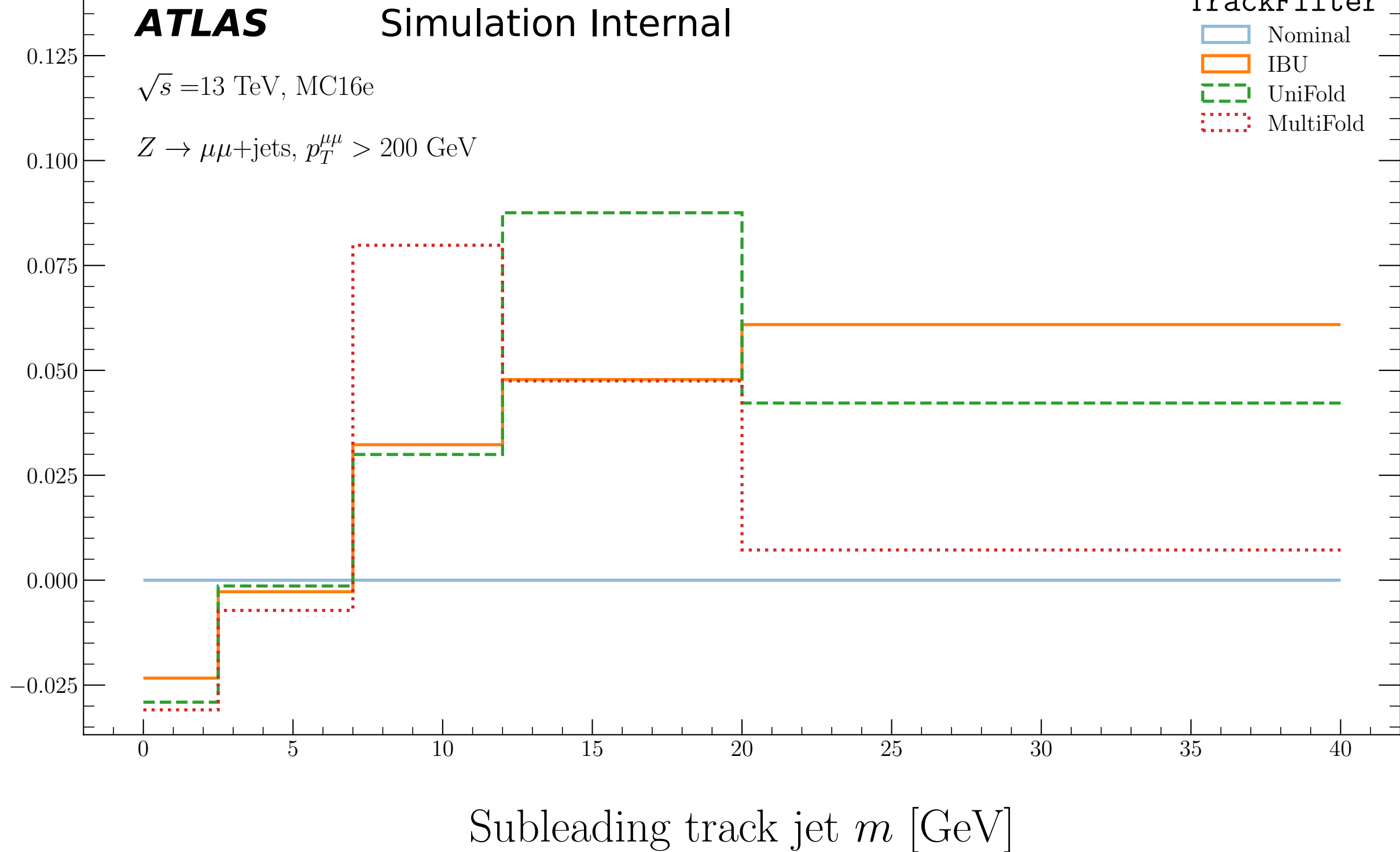
Simulation Internal

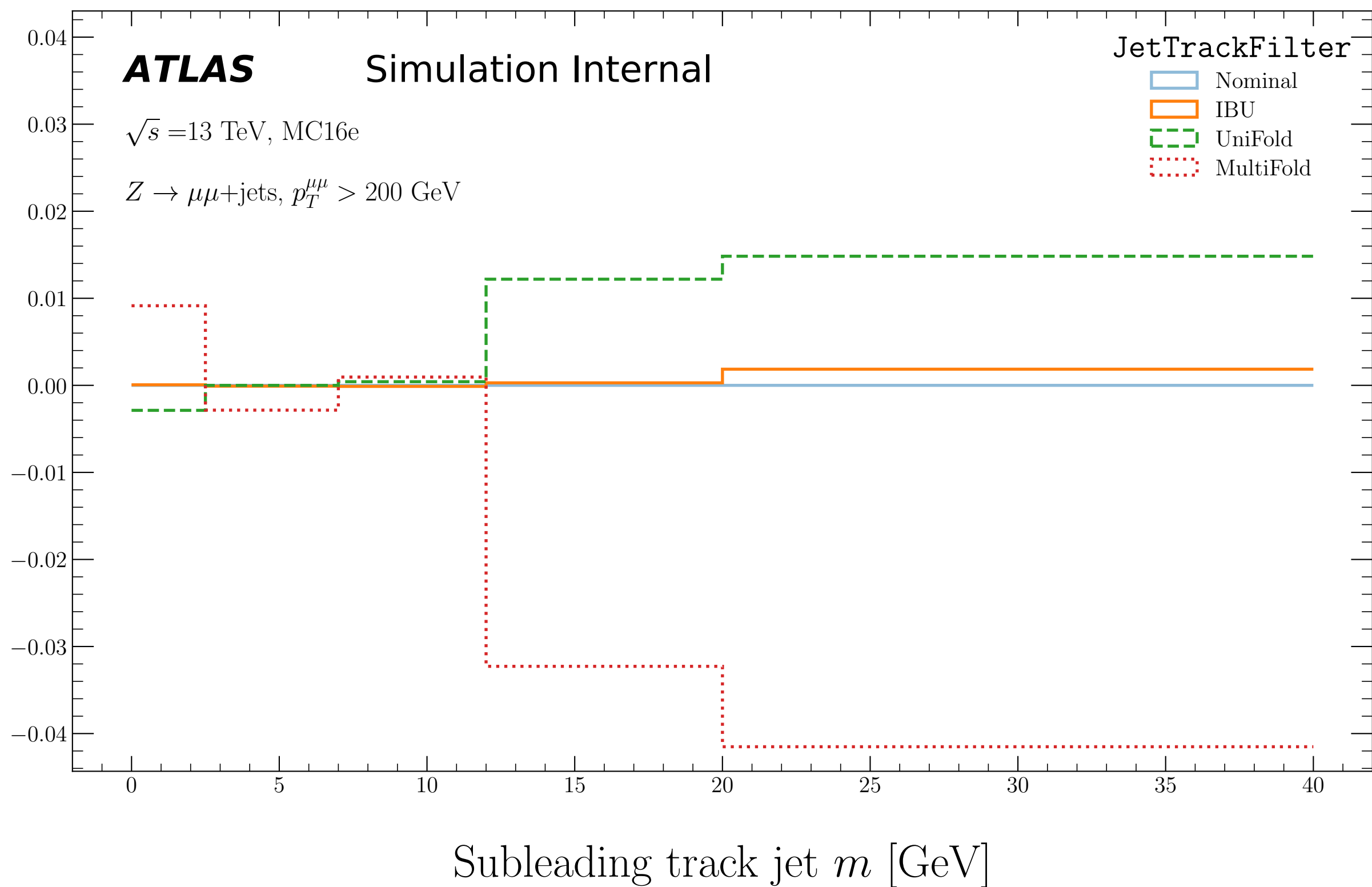
 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

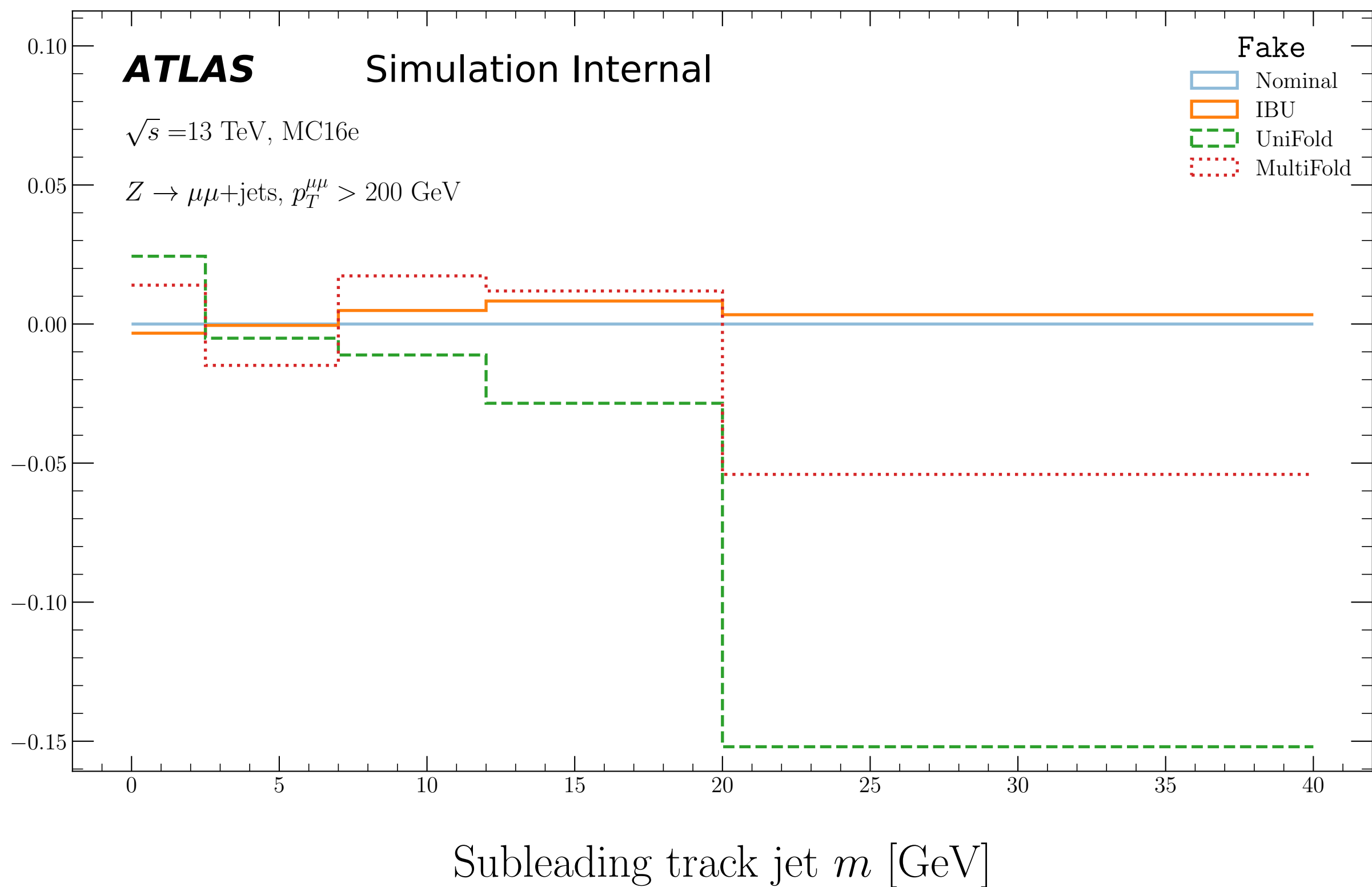
pTScale

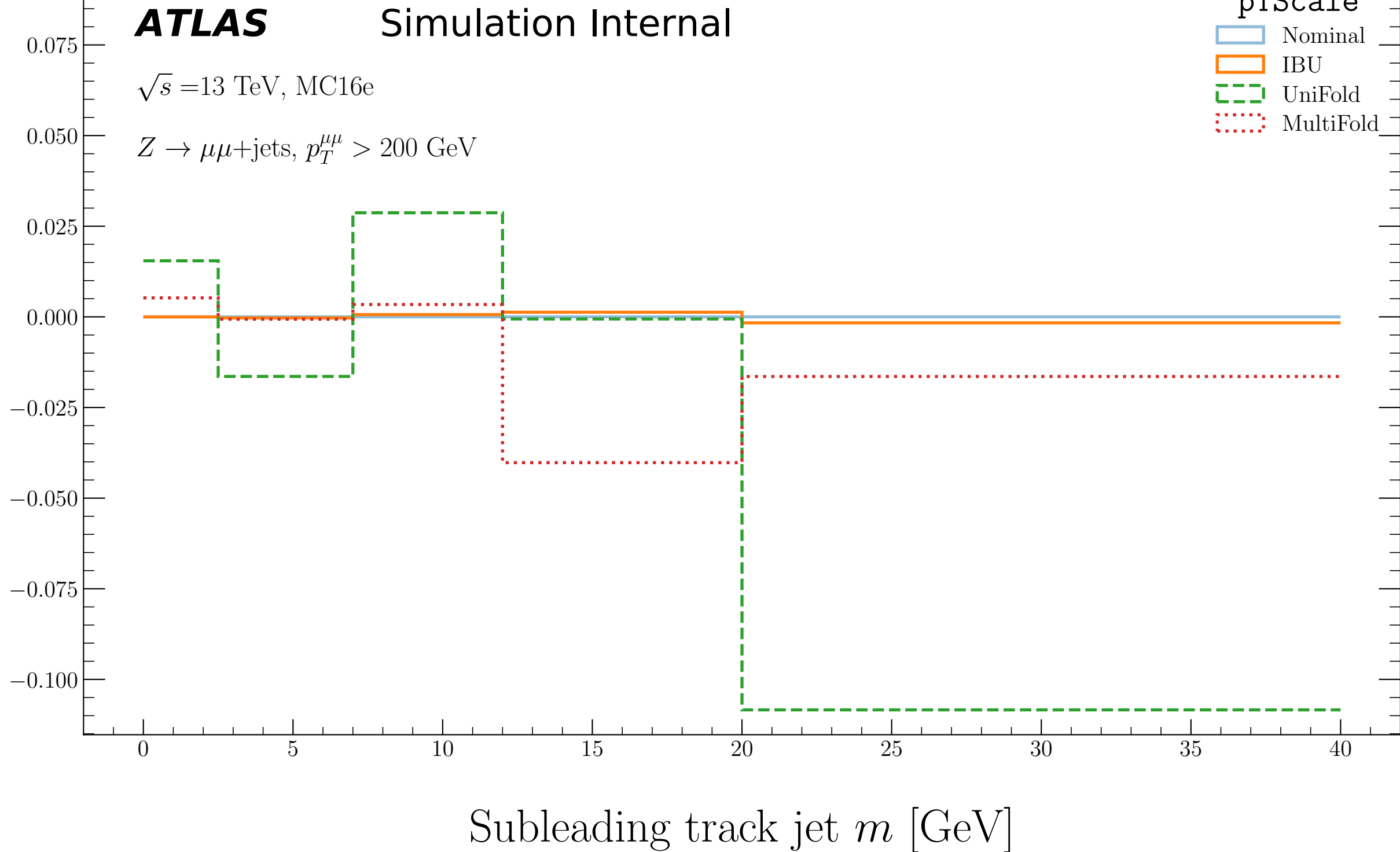
- Nominal
- IBU
- UniFold
- MultiFold

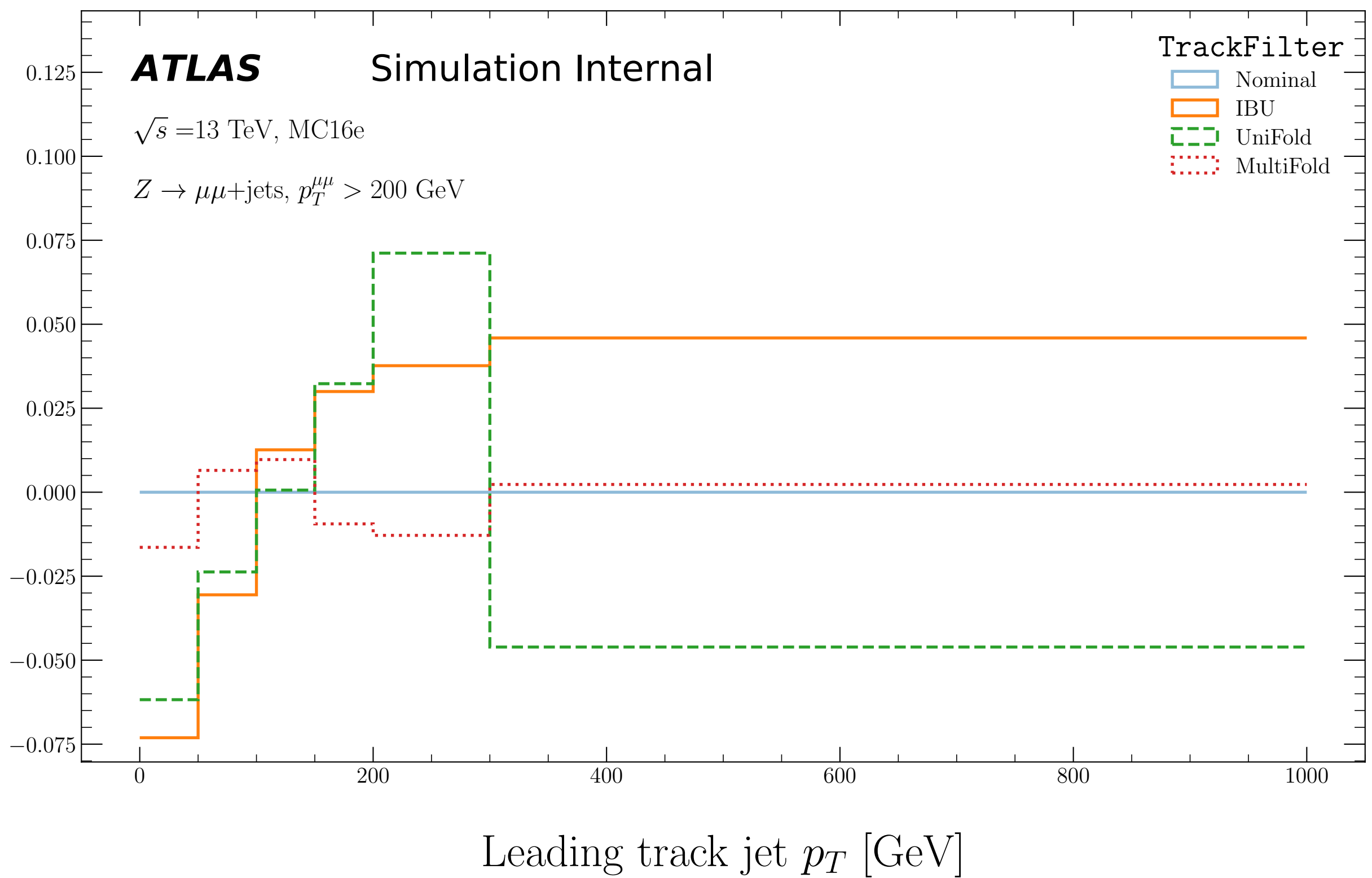
Leading track jet m [GeV]

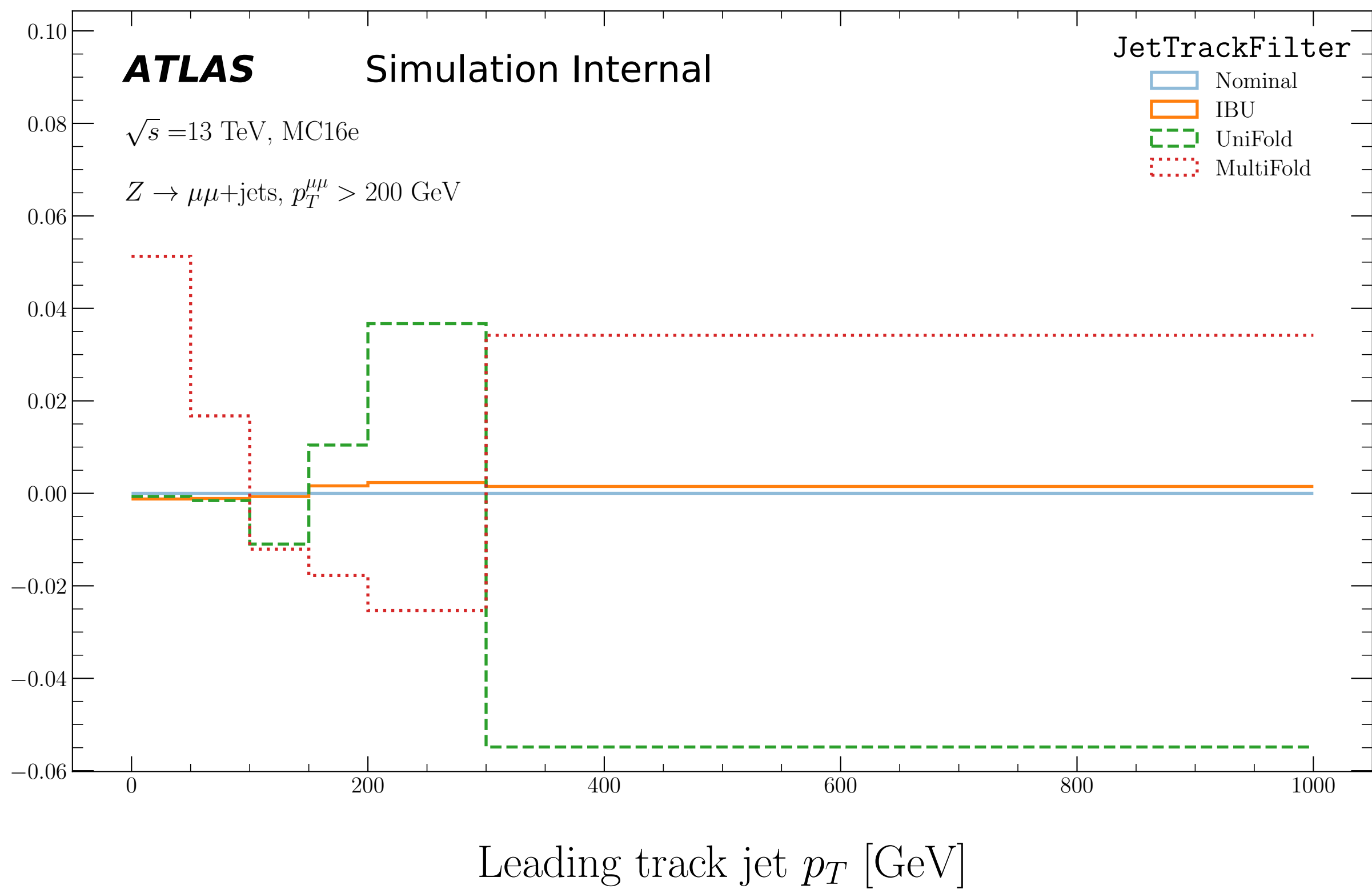


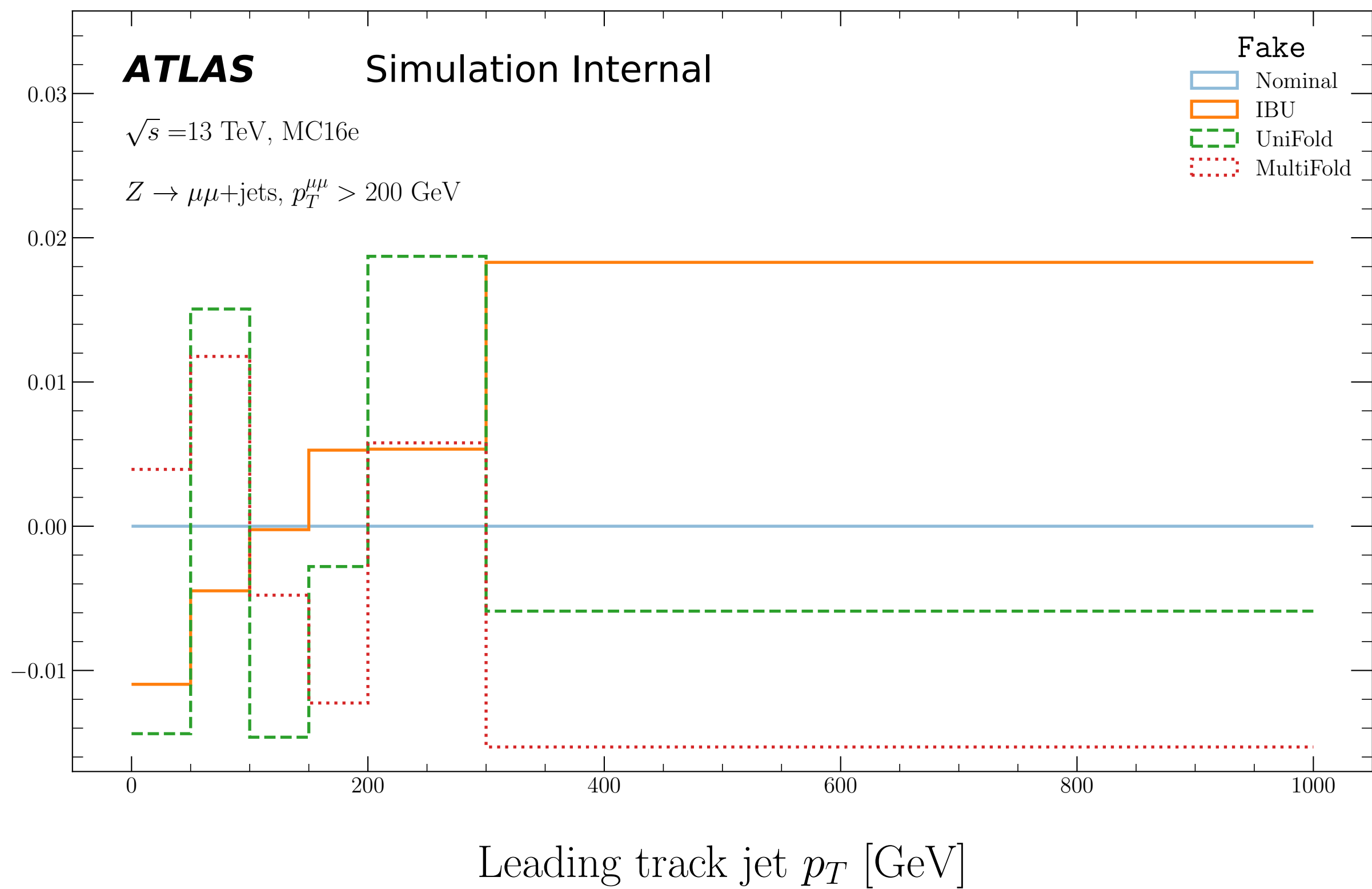


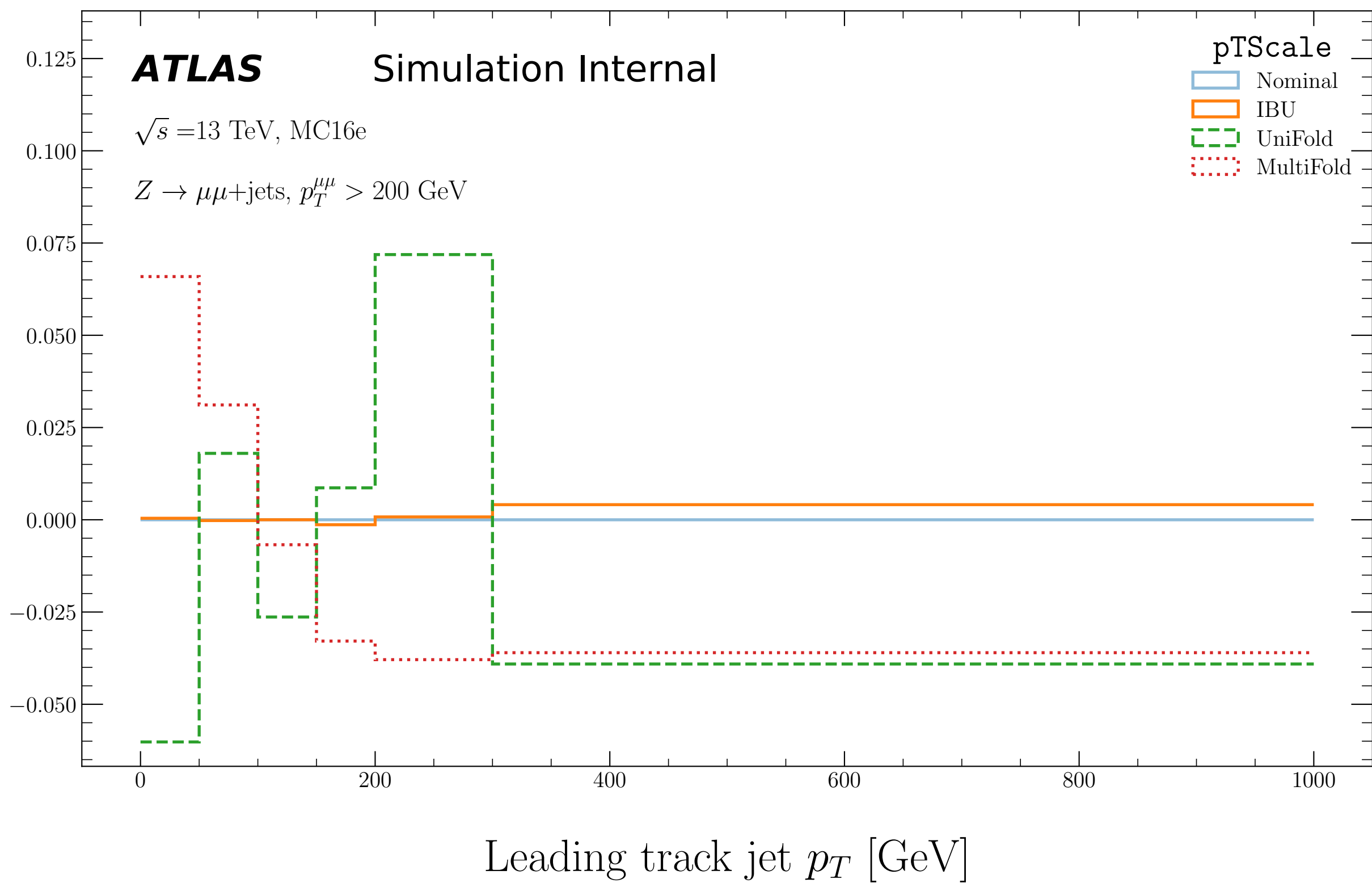


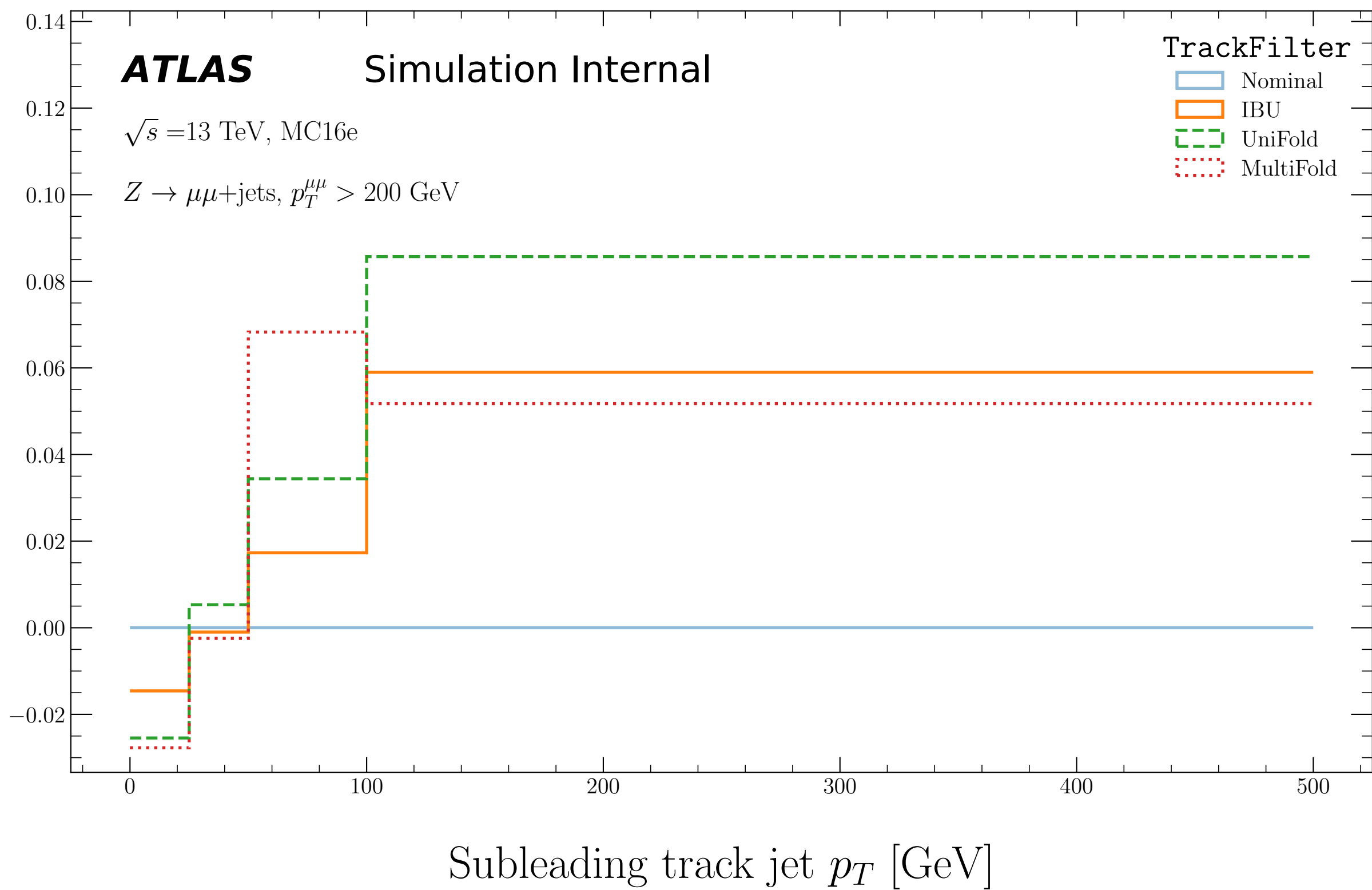


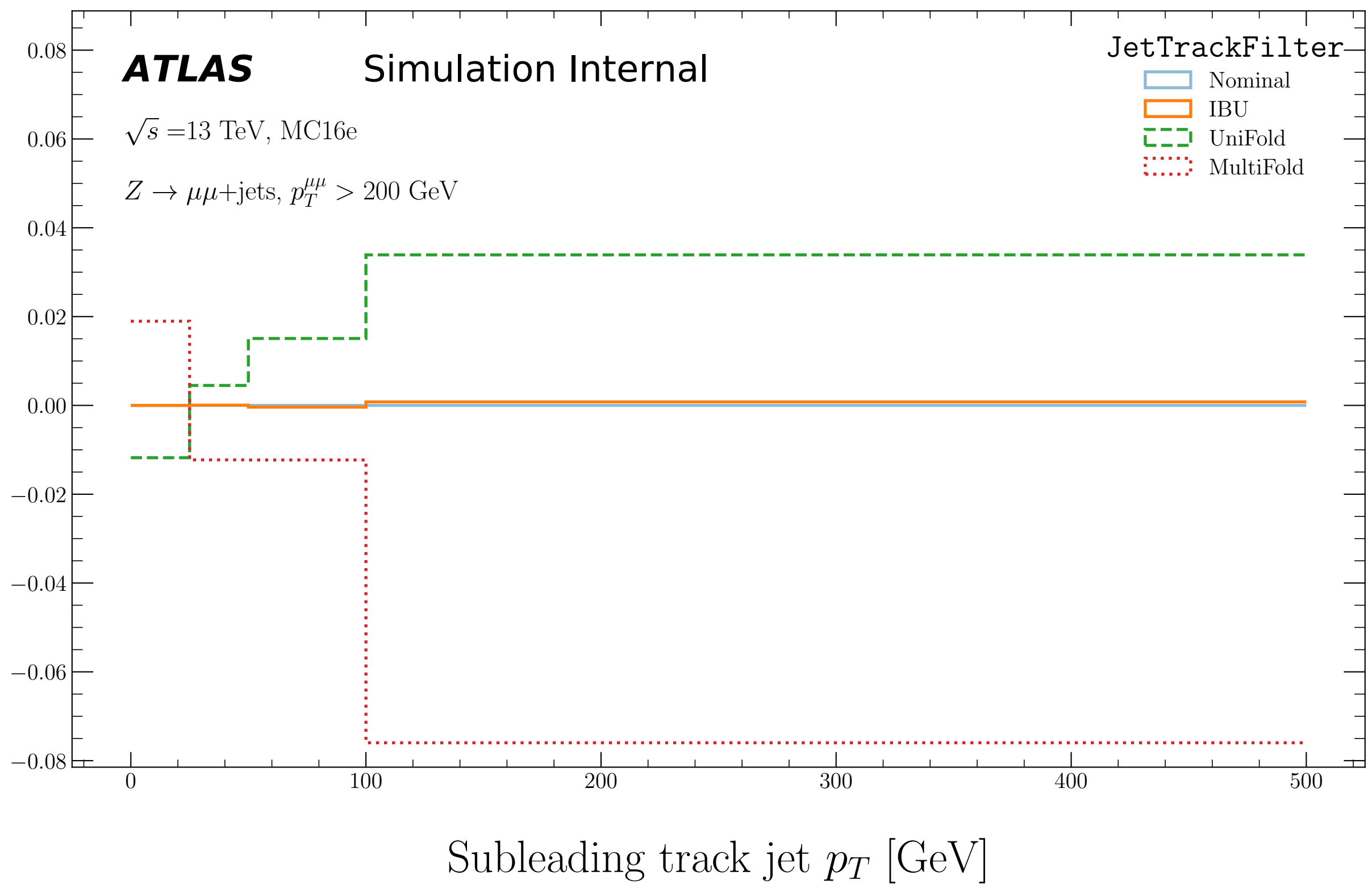


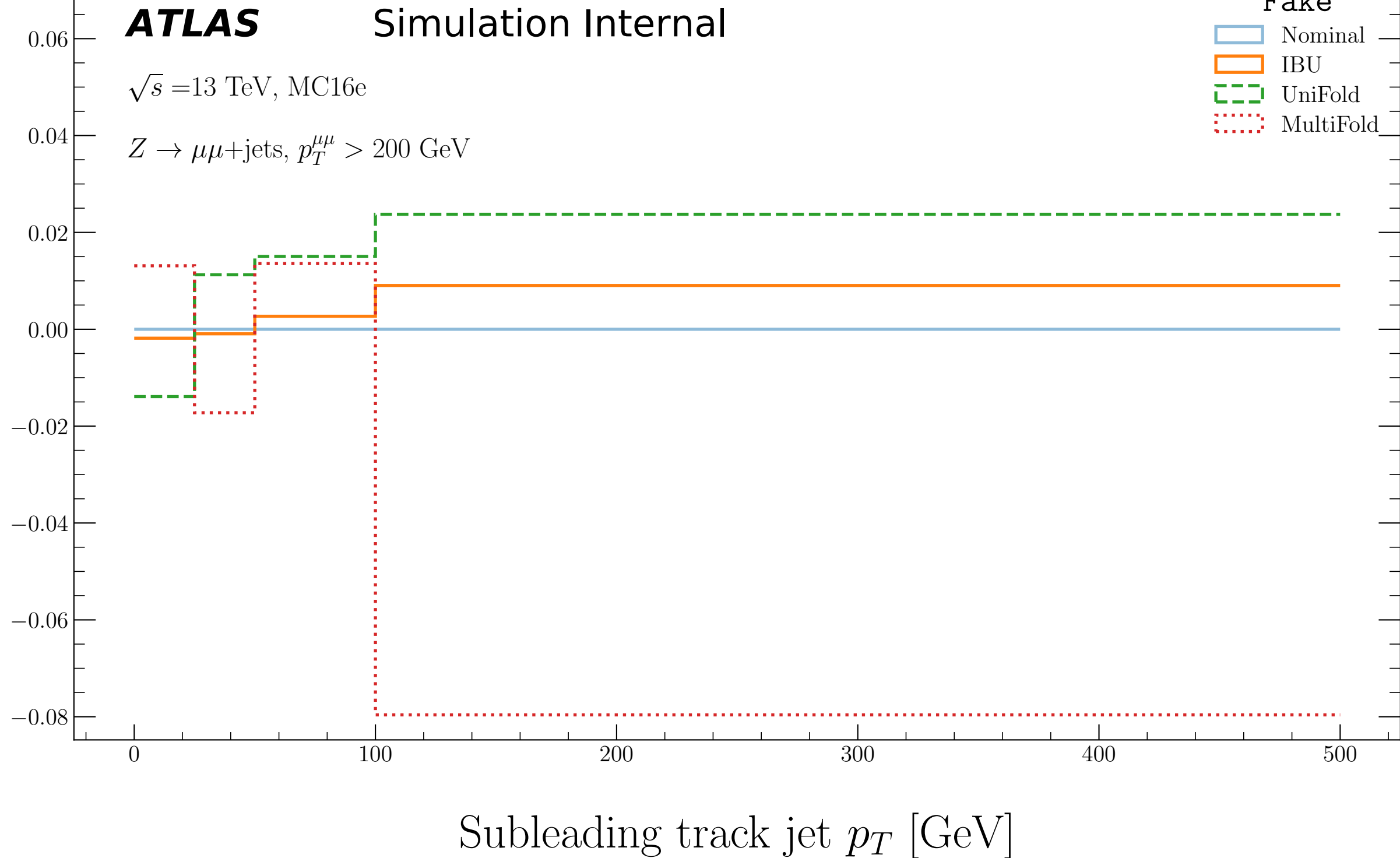


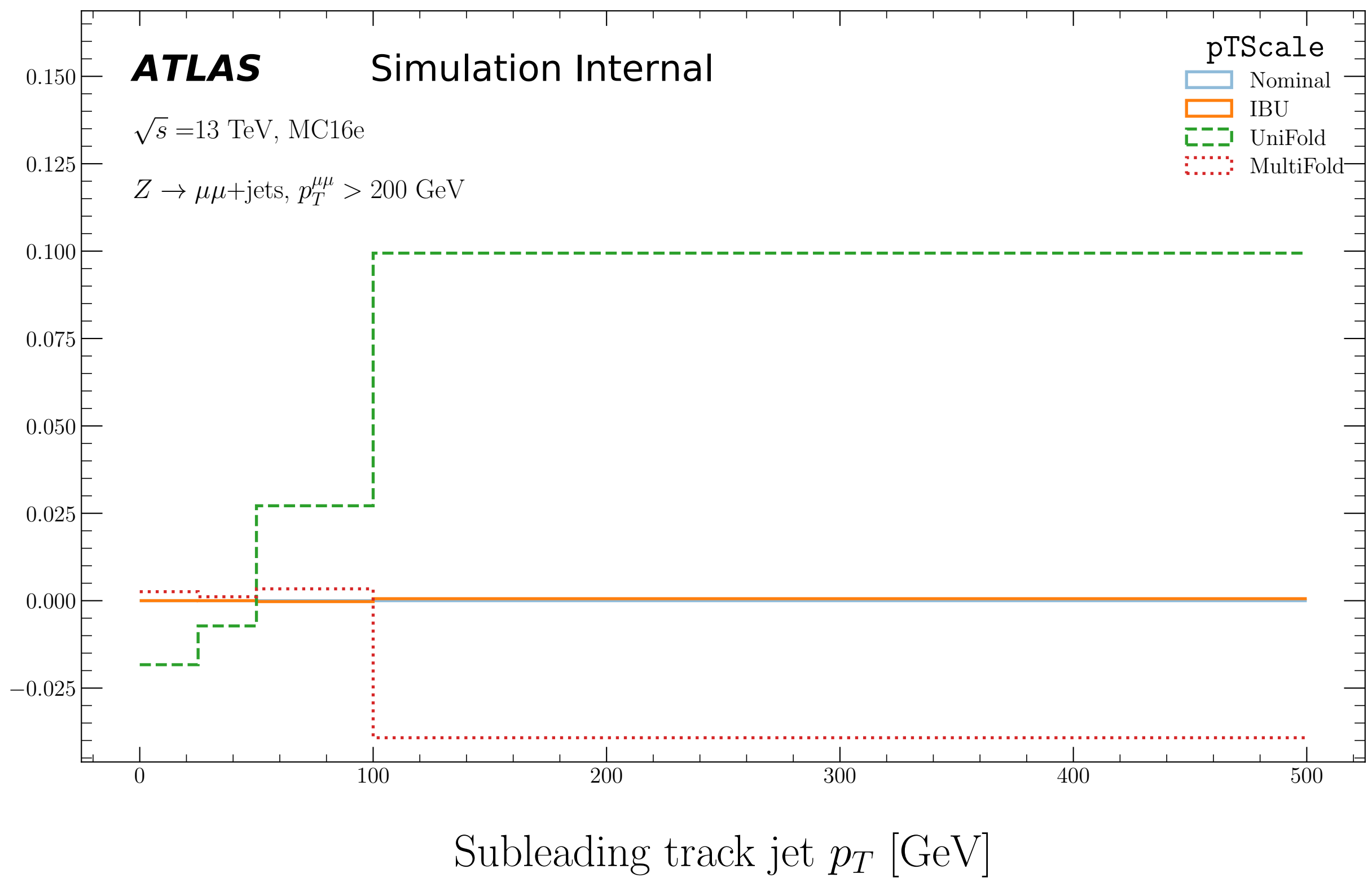


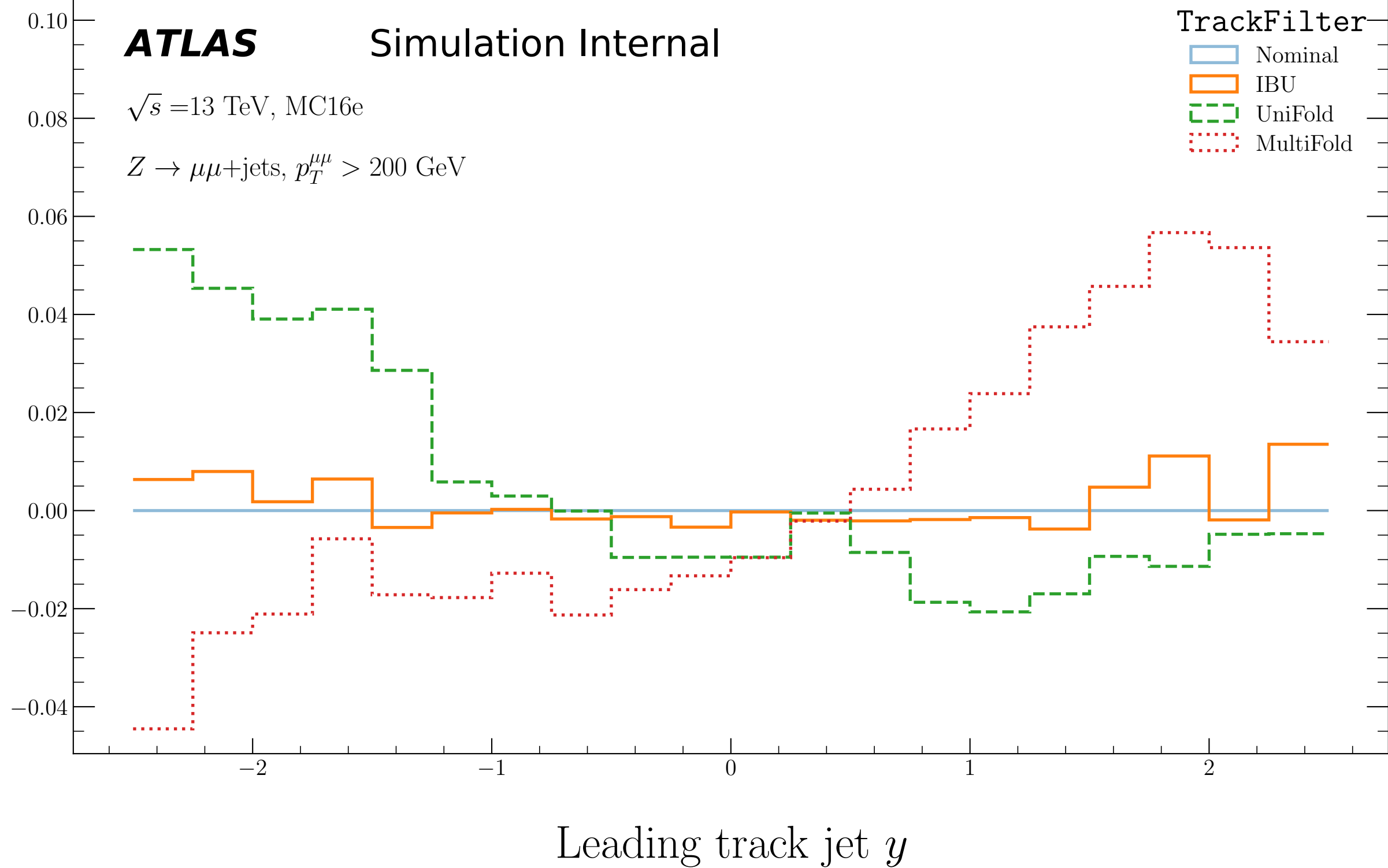












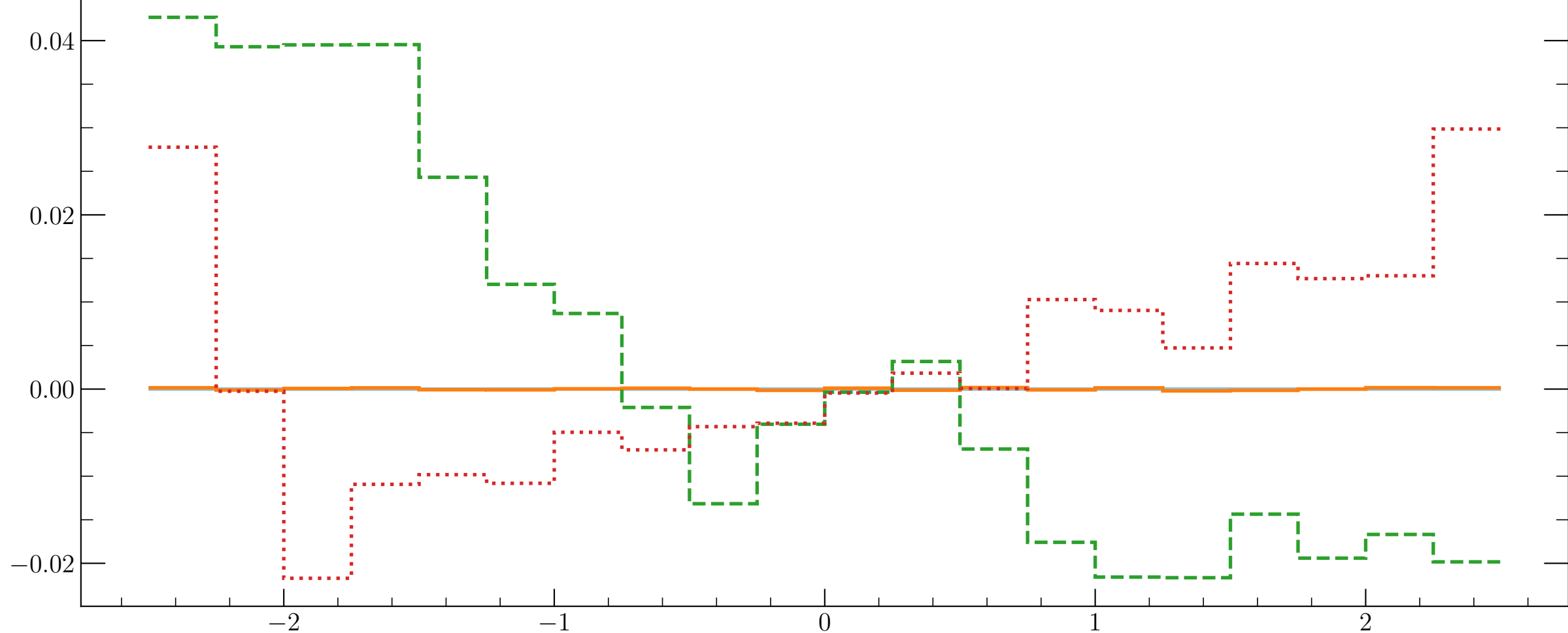
ATLAS

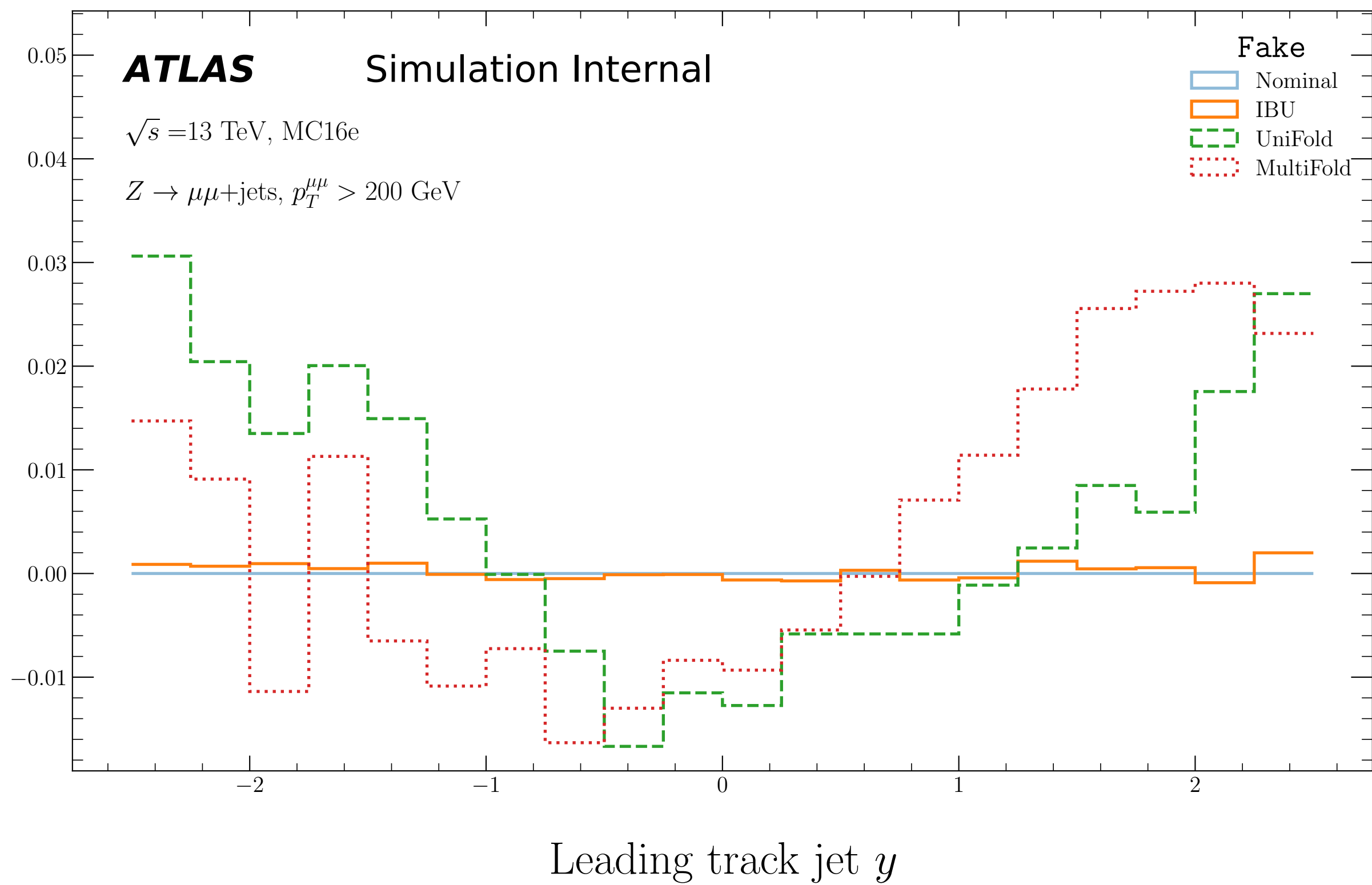
Simulation Internal

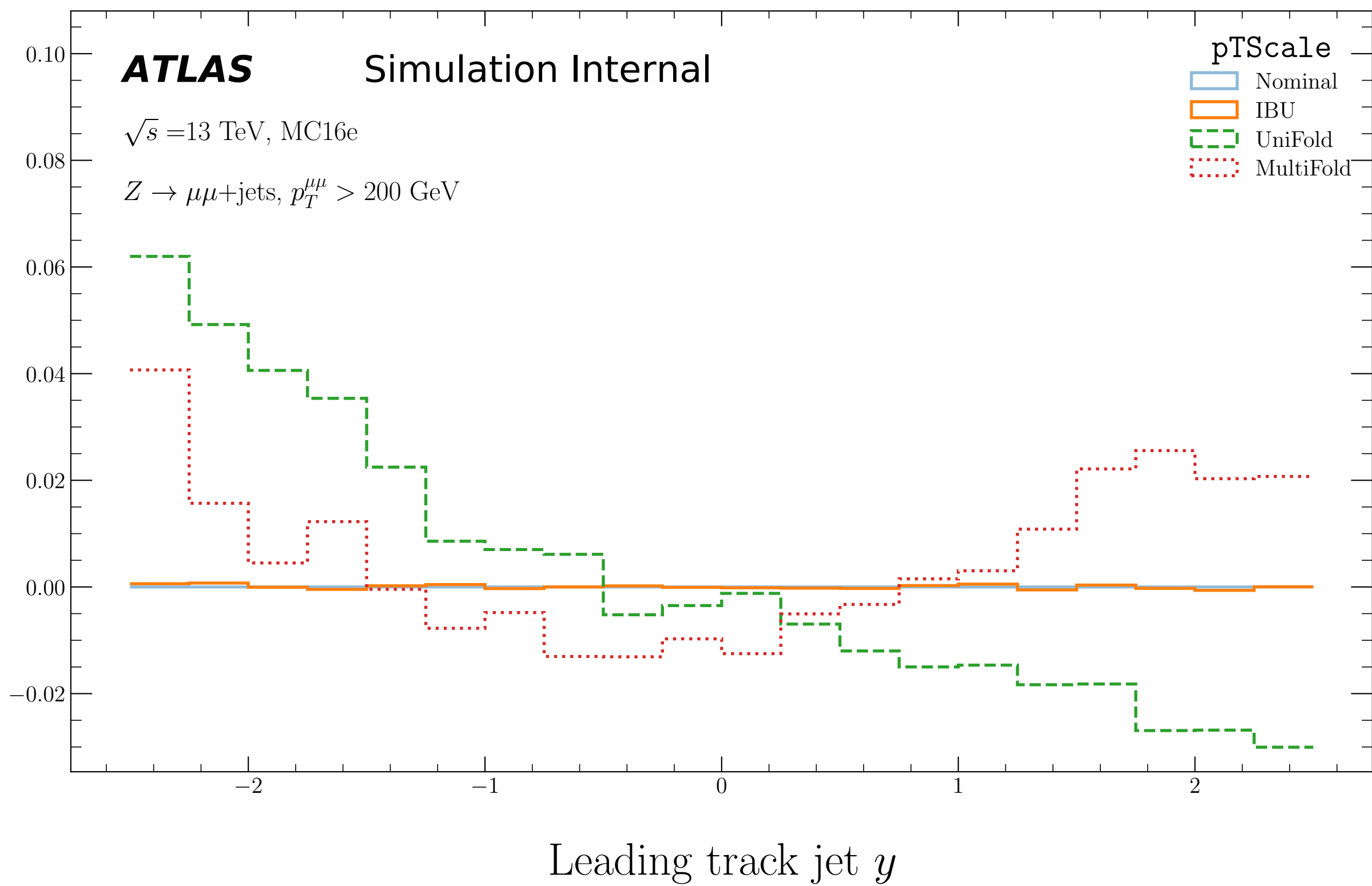
JetTrackFilter

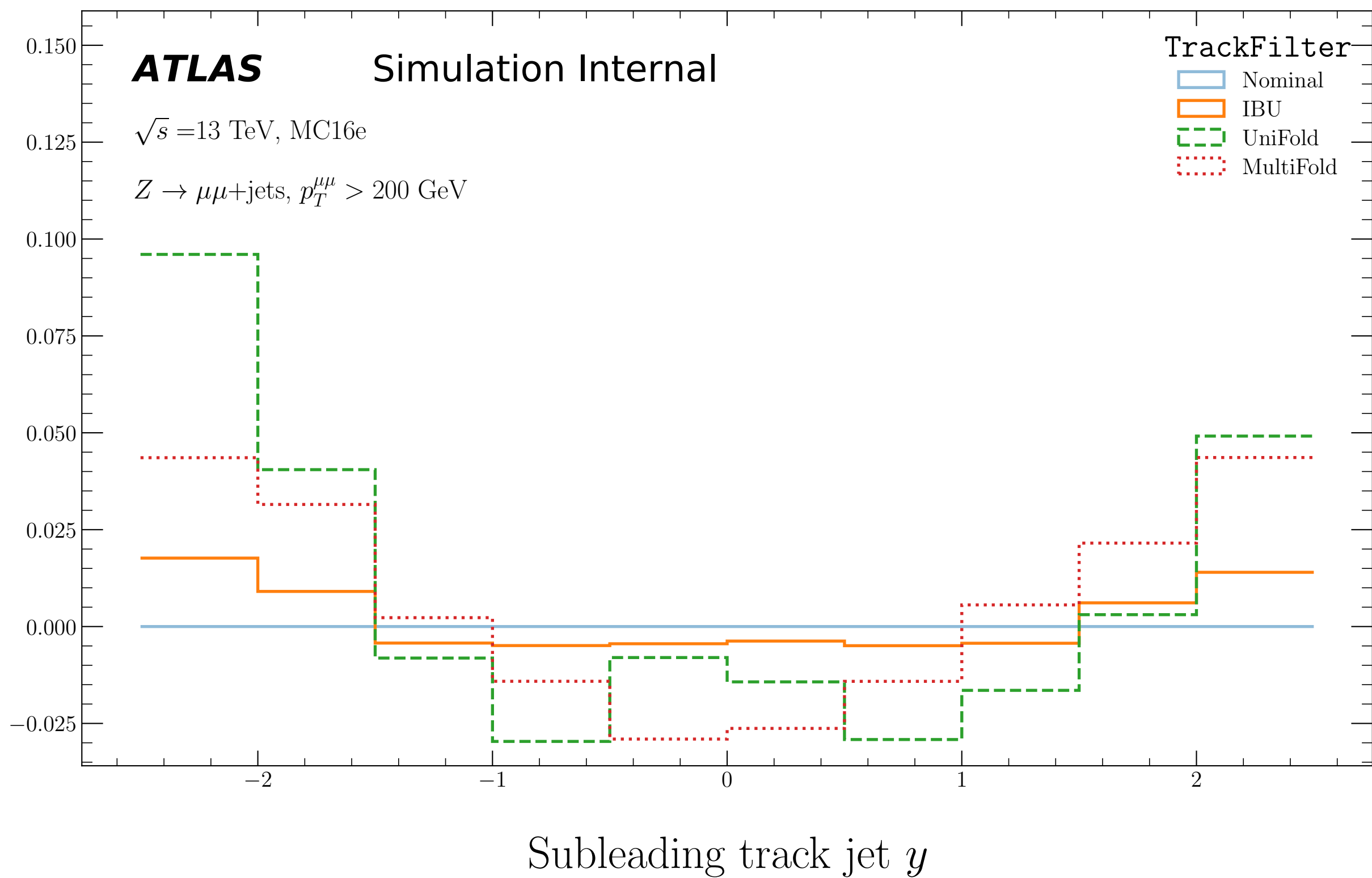
 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet y







ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

- Nominal
- IBU
- UniFold
- MultiFold

0.06
0.04
0.02
0.00
-0.02

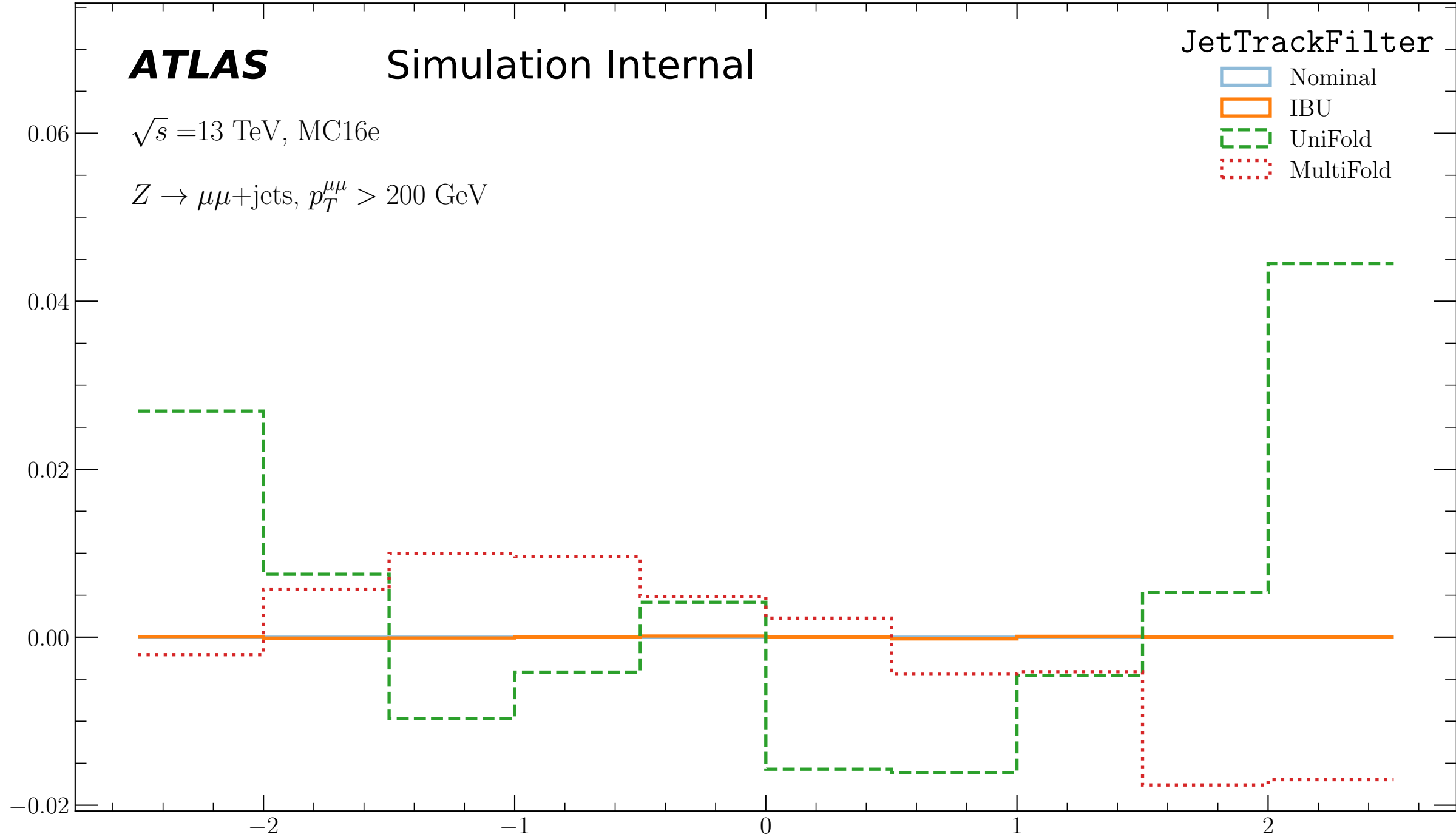
-2

-1

0

1

2

Subleading track jet y 

ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold

0.10
0.08
0.06
0.04
0.02
0.00
-0.02

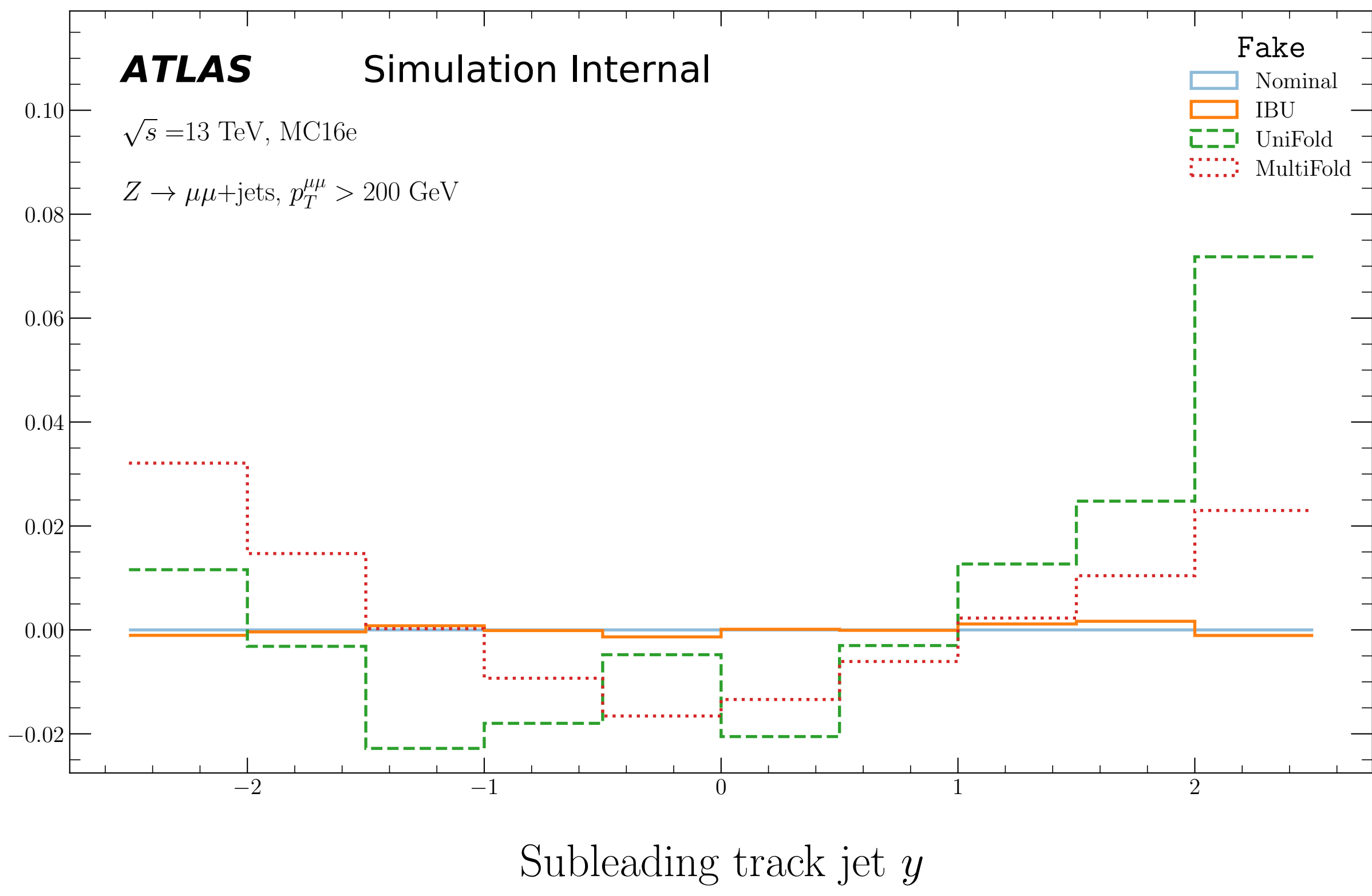
-2

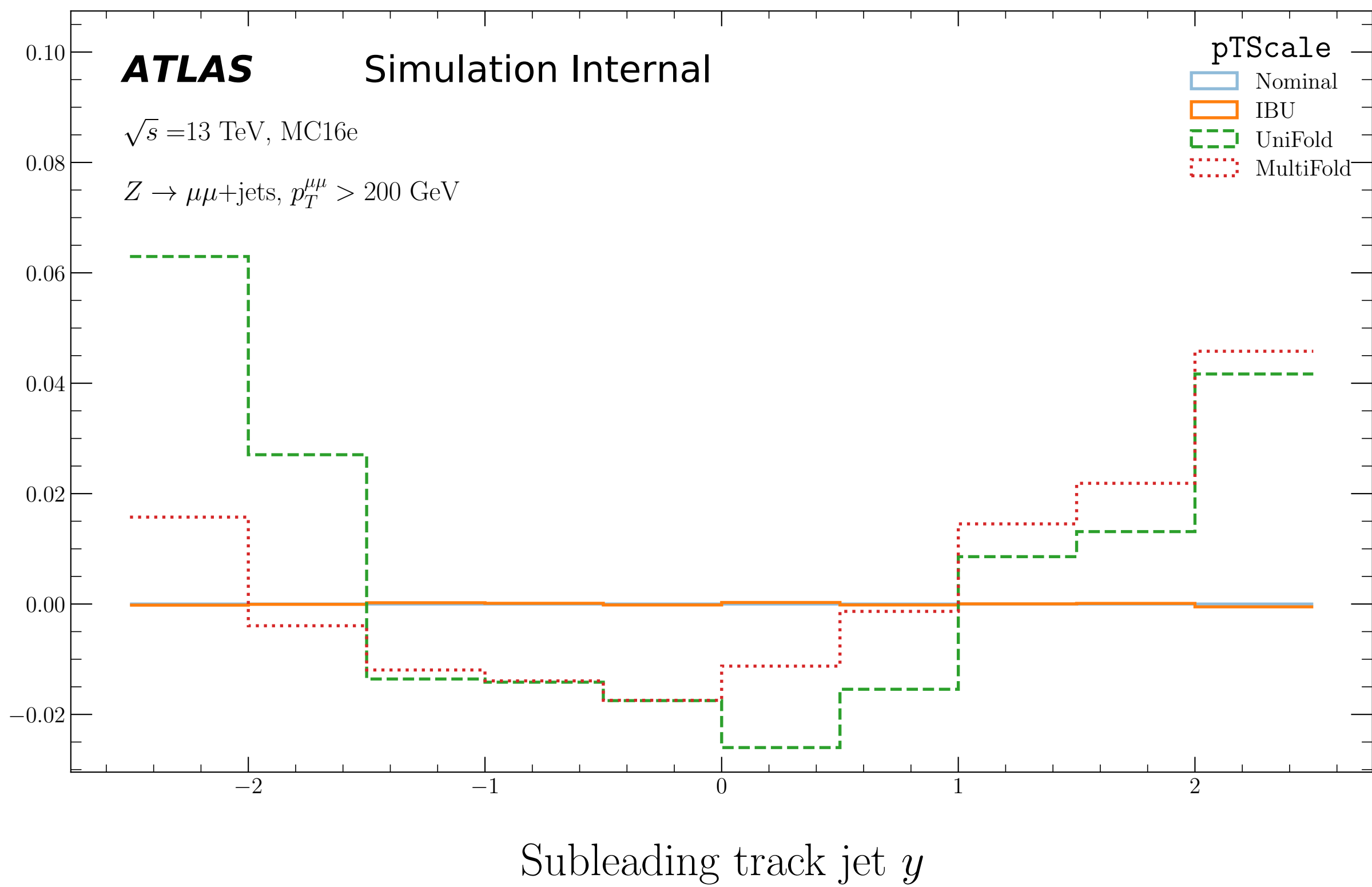
-1

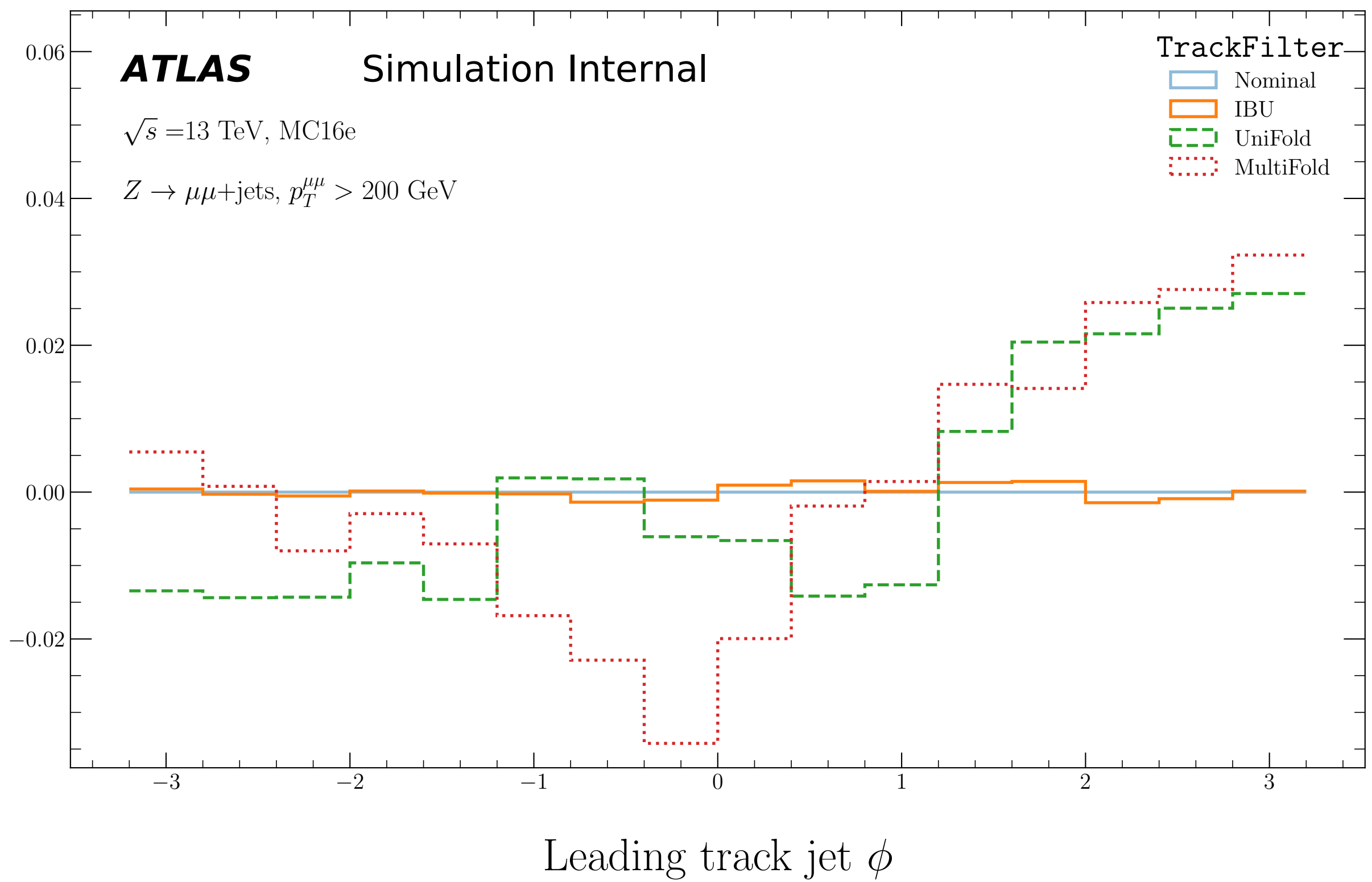
0

1

2

Subleading track jet y 





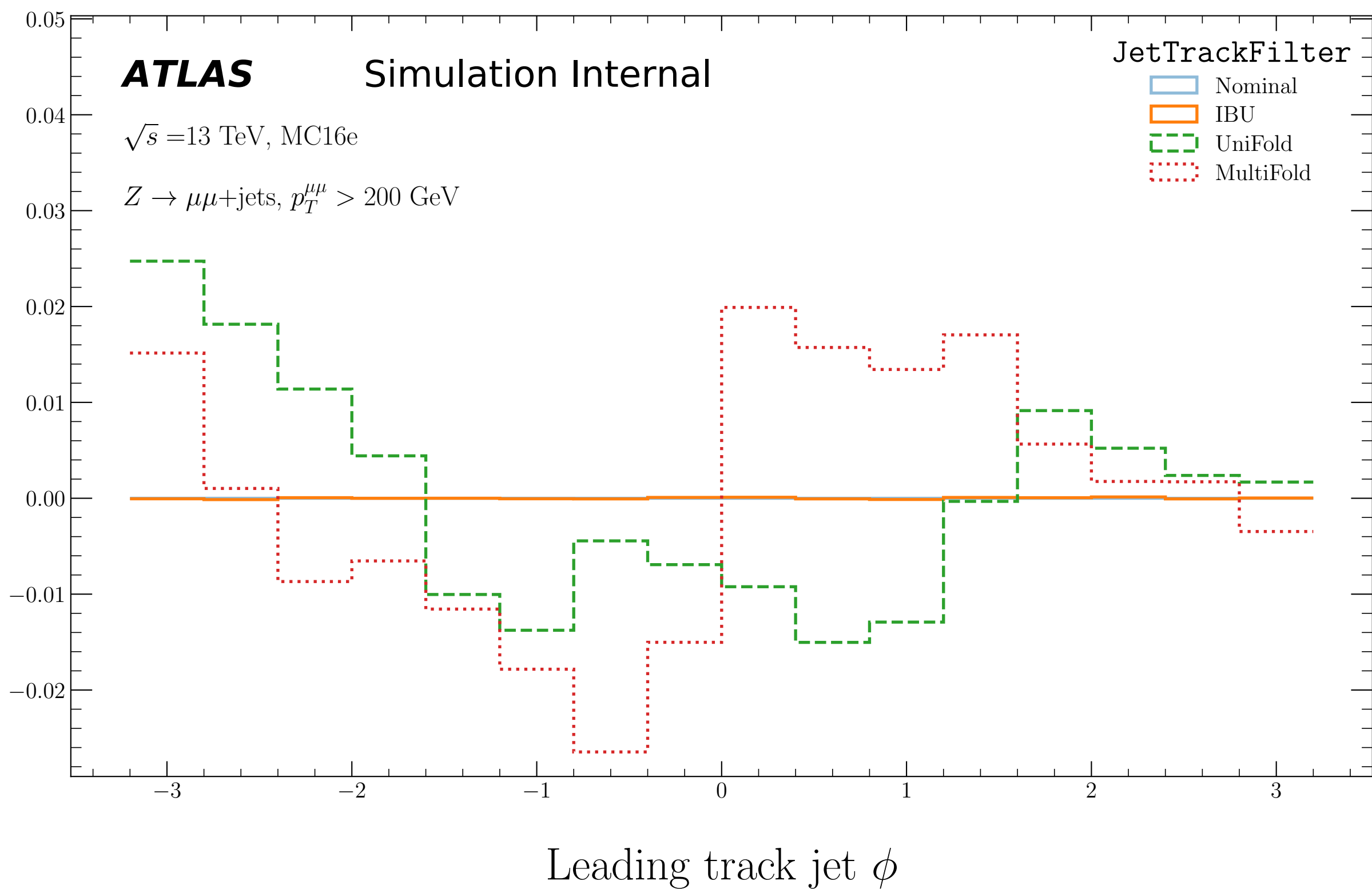
ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

JetTrackFilter

- Nominal
- IBU
- UniFold
- MultiFold



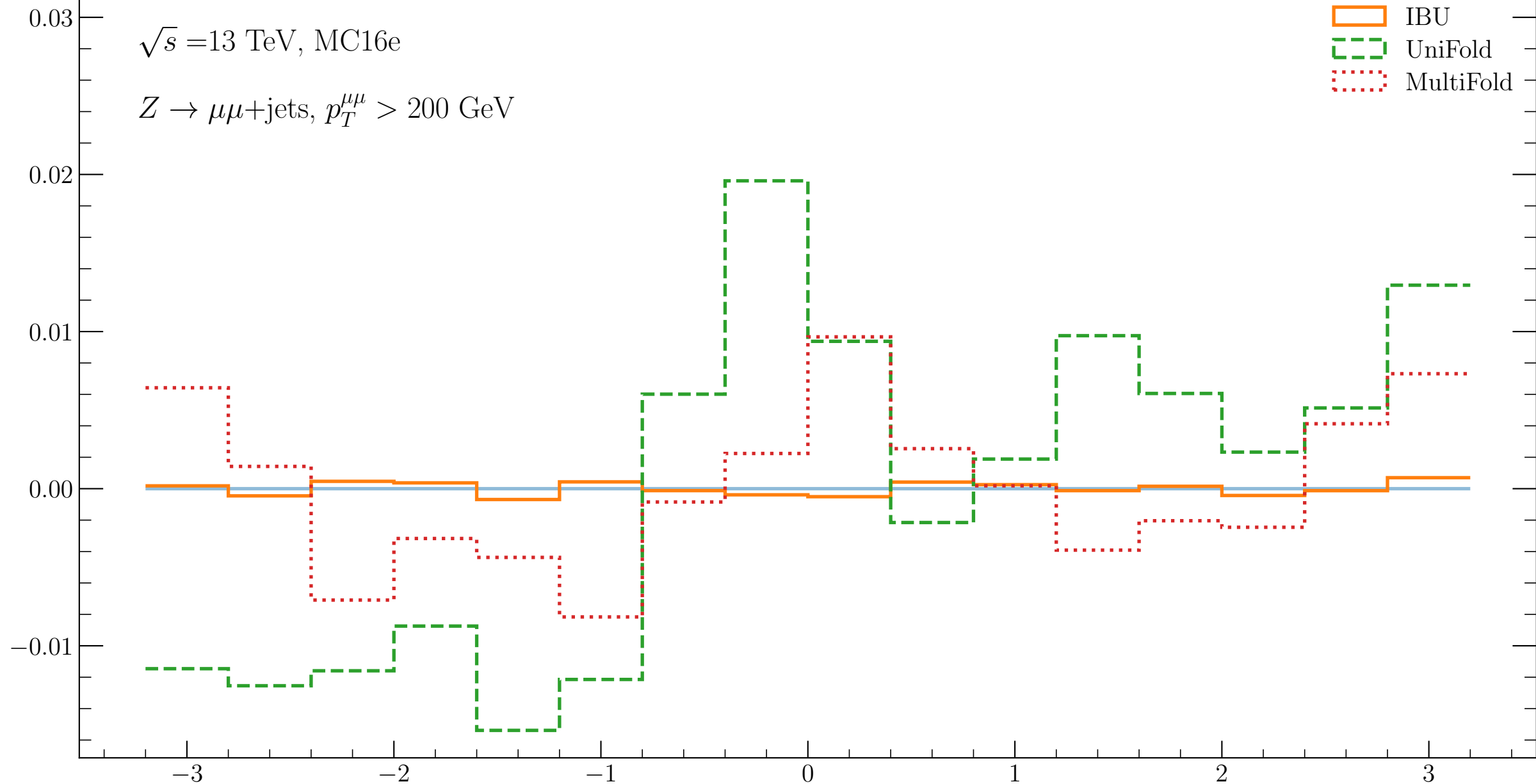
ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet ϕ

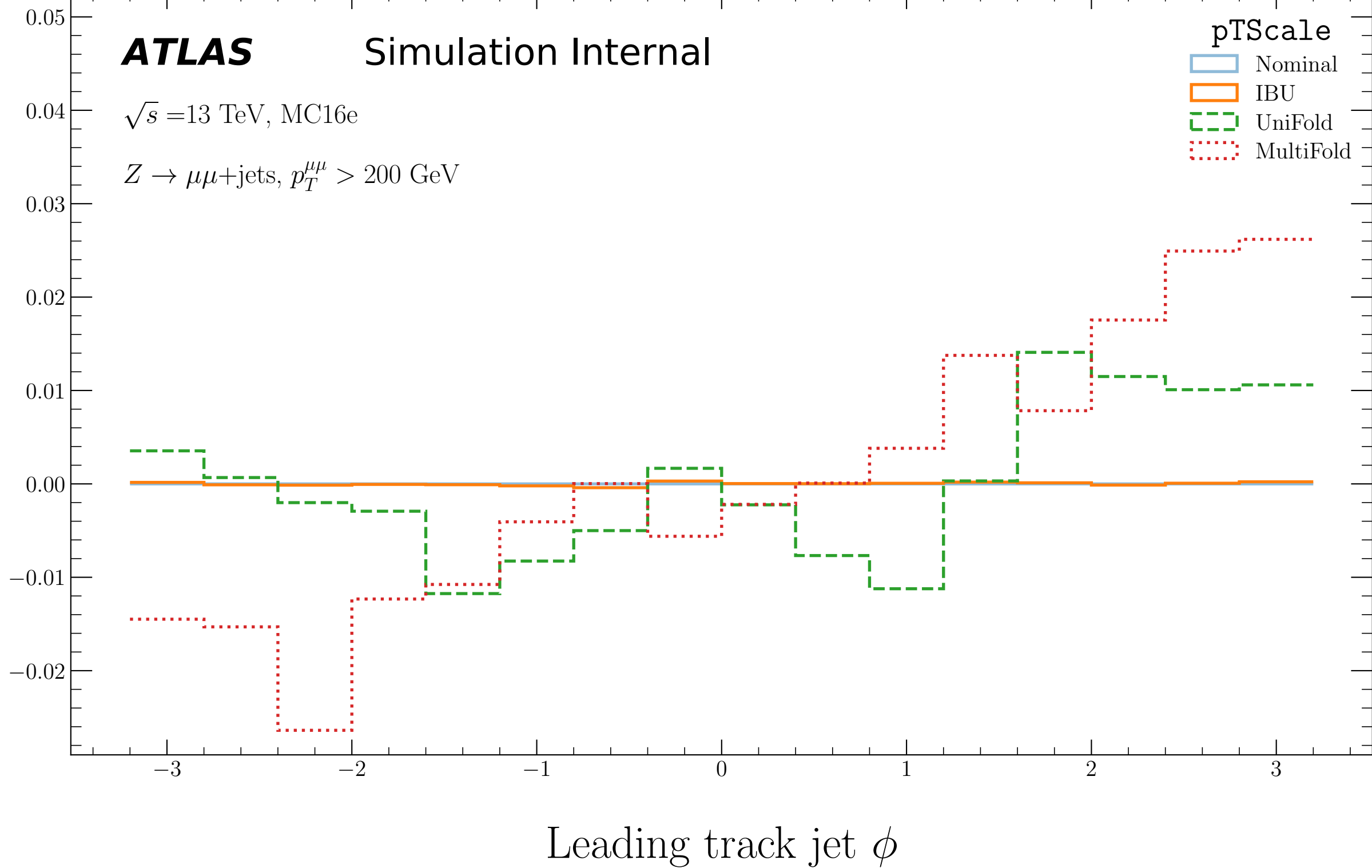
ATLAS

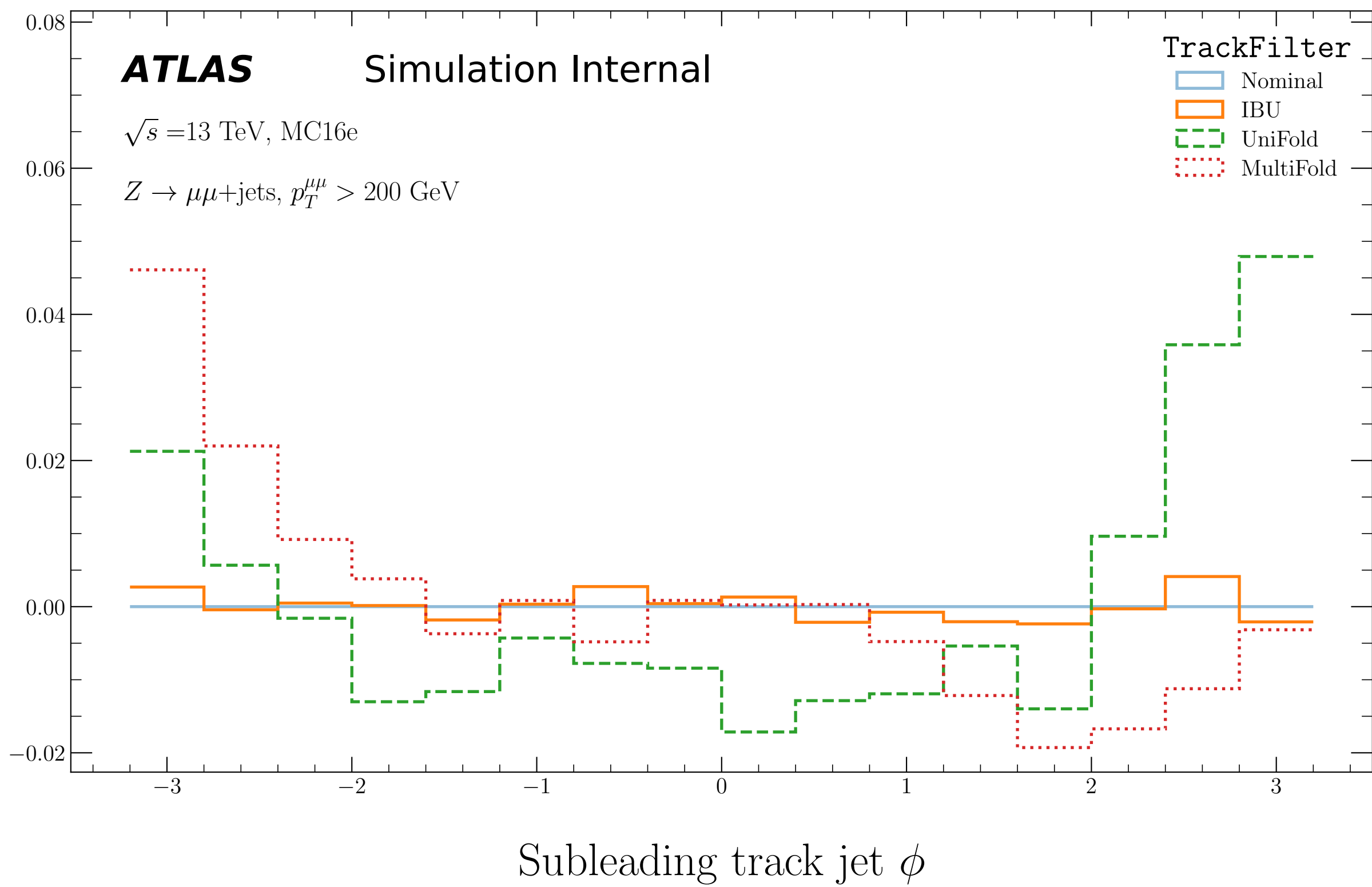
Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

pTScale

- Nominal
- IBU
- UniFold
- MultiFold





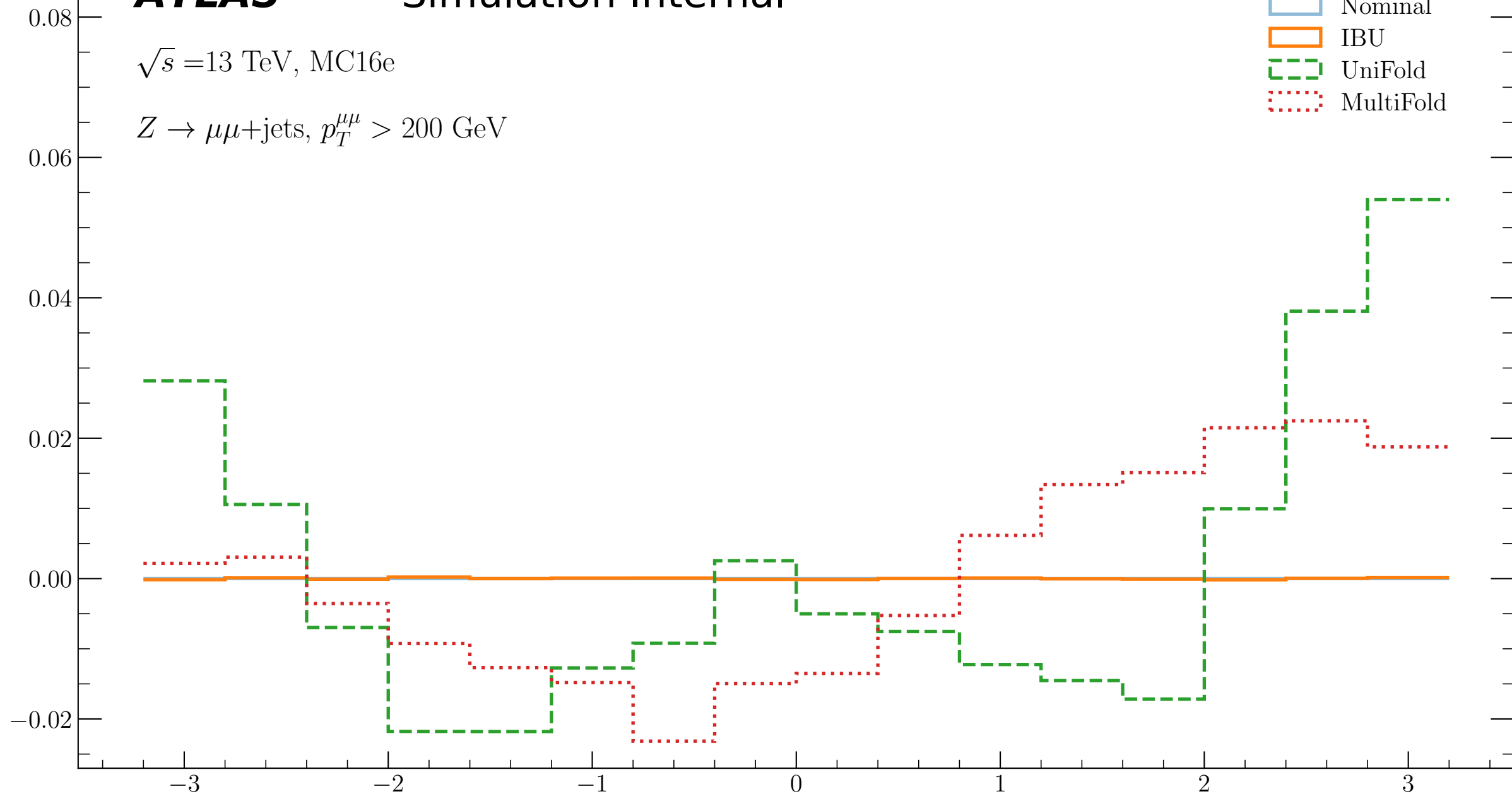
ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

JetTrackFilter

- Nominal
- IBU
- UniFold
- MultiFold

Subleading track jet ϕ

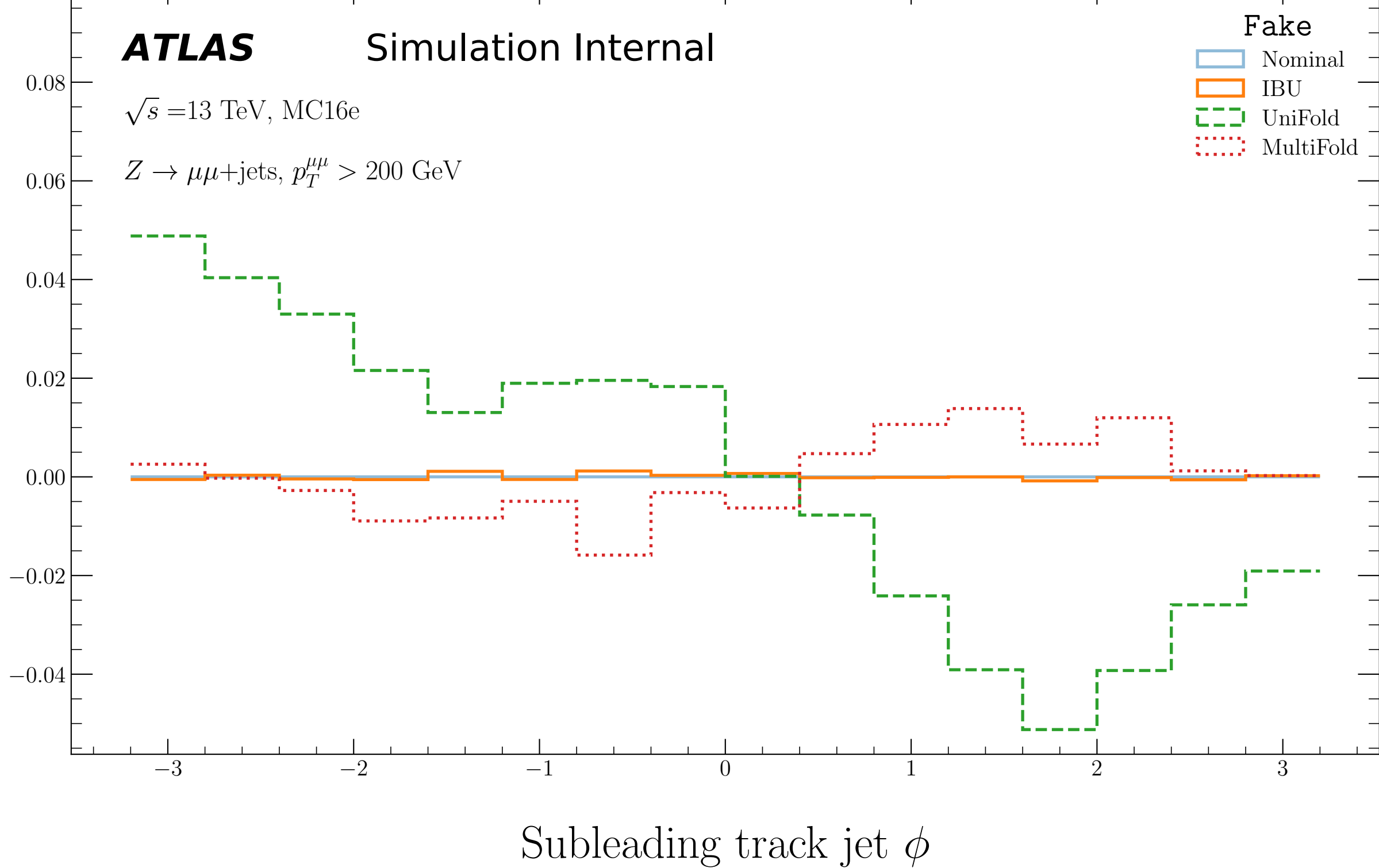
ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold



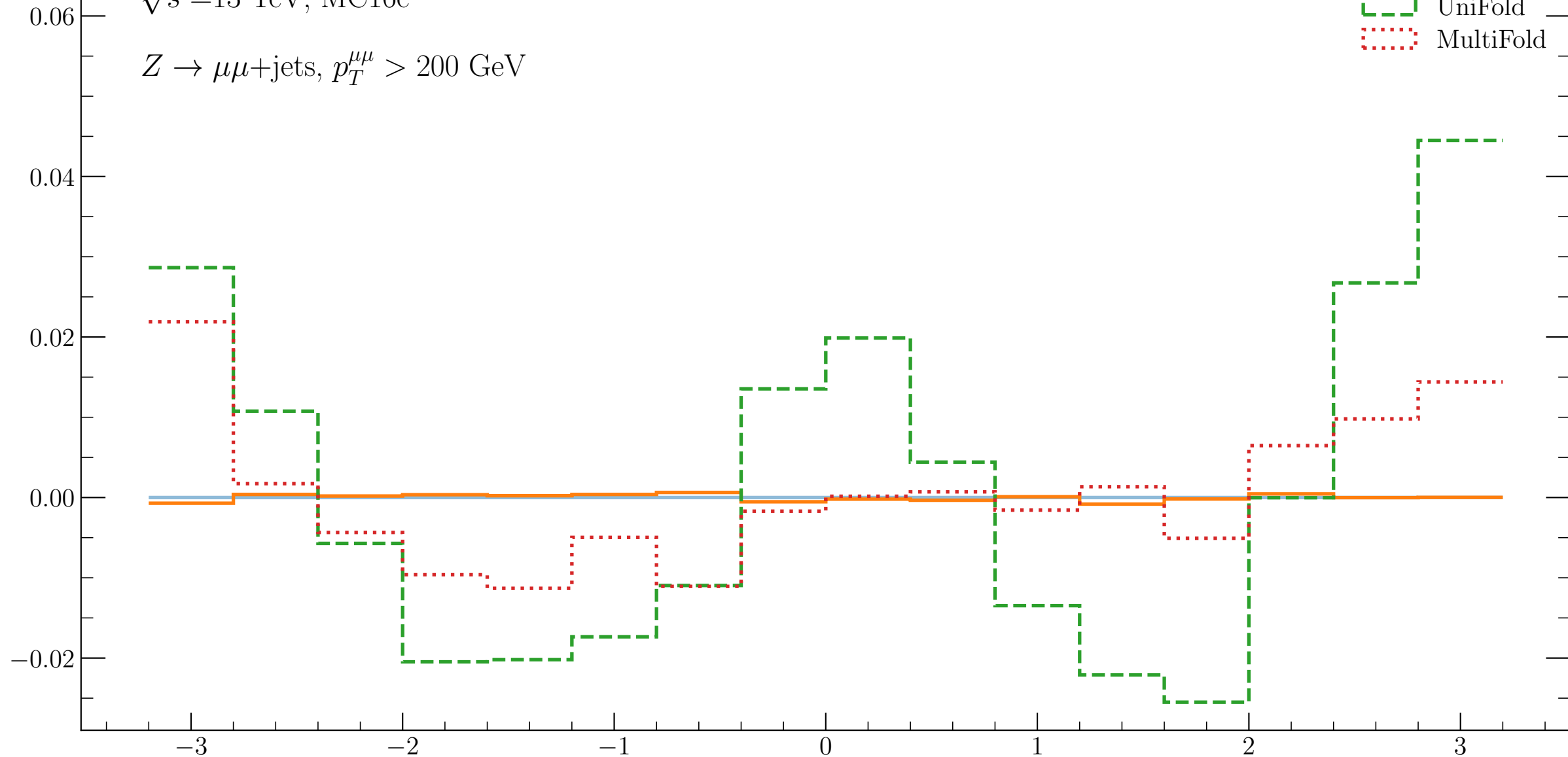
ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

pTScale

- Nominal
- IBU
- UniFold
- MultiFold

Subleading track jet ϕ

ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

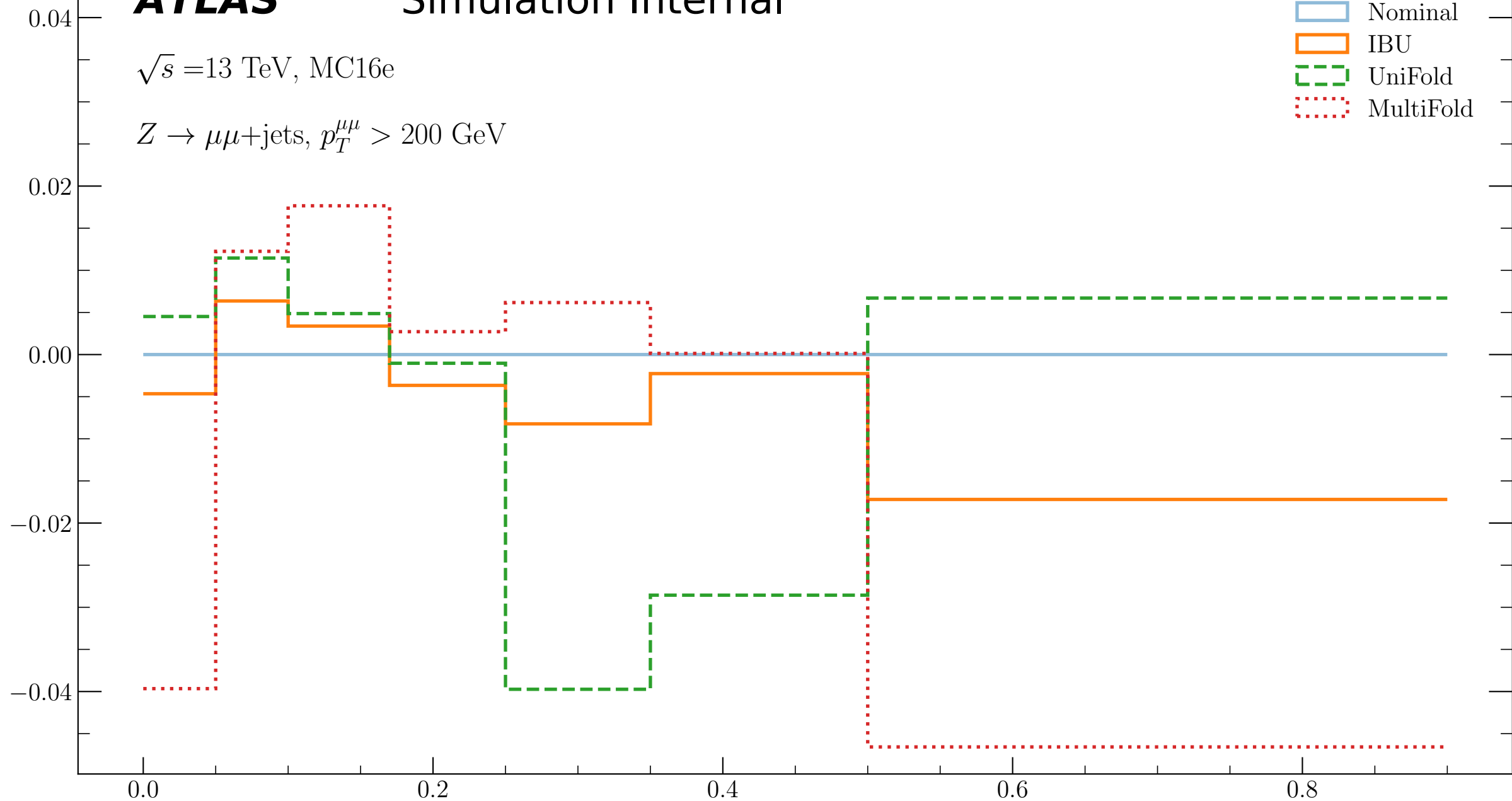
TrackFilter

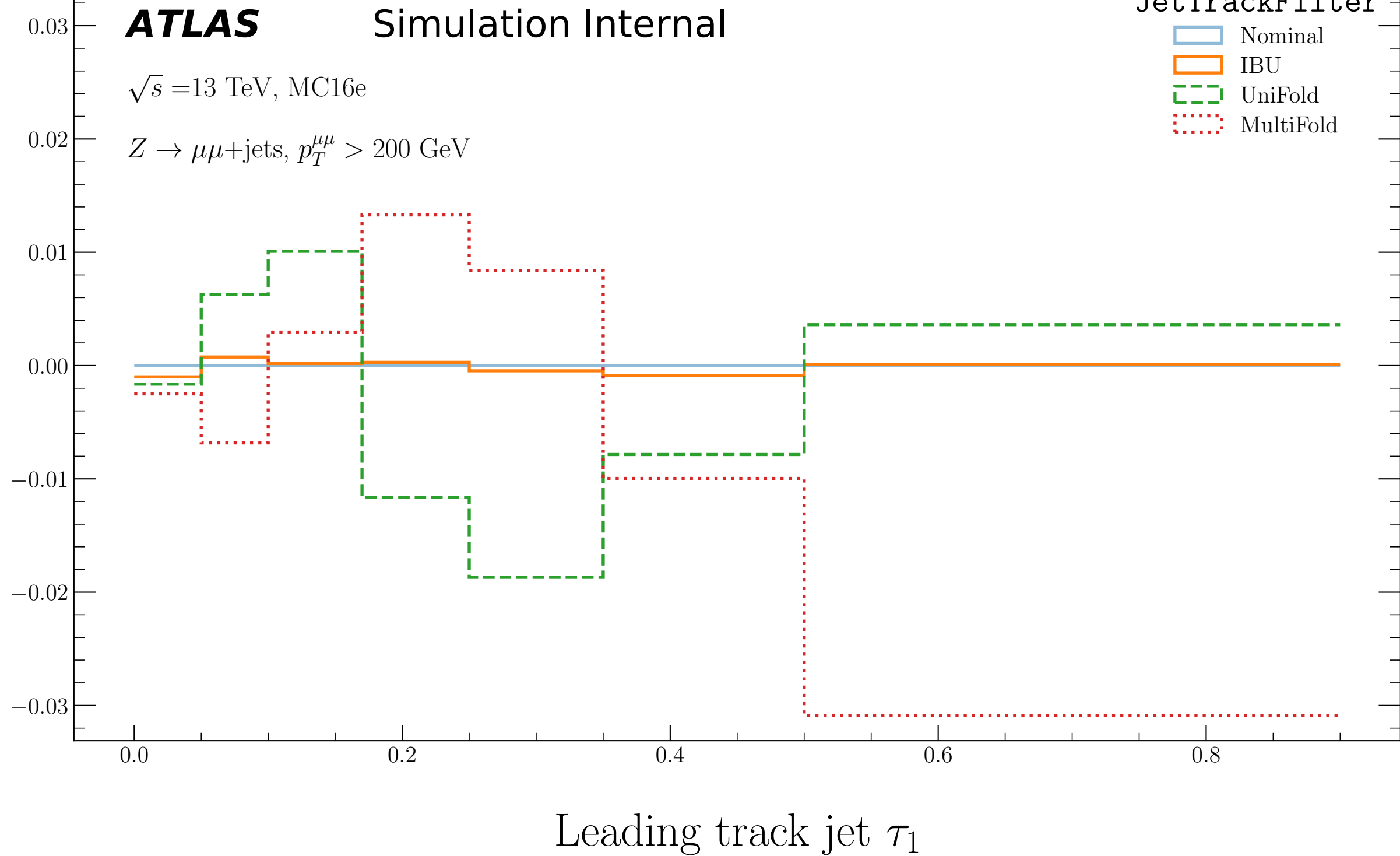
Nominal

IBU

UniFold

MultiFold

Leading track jet τ_1



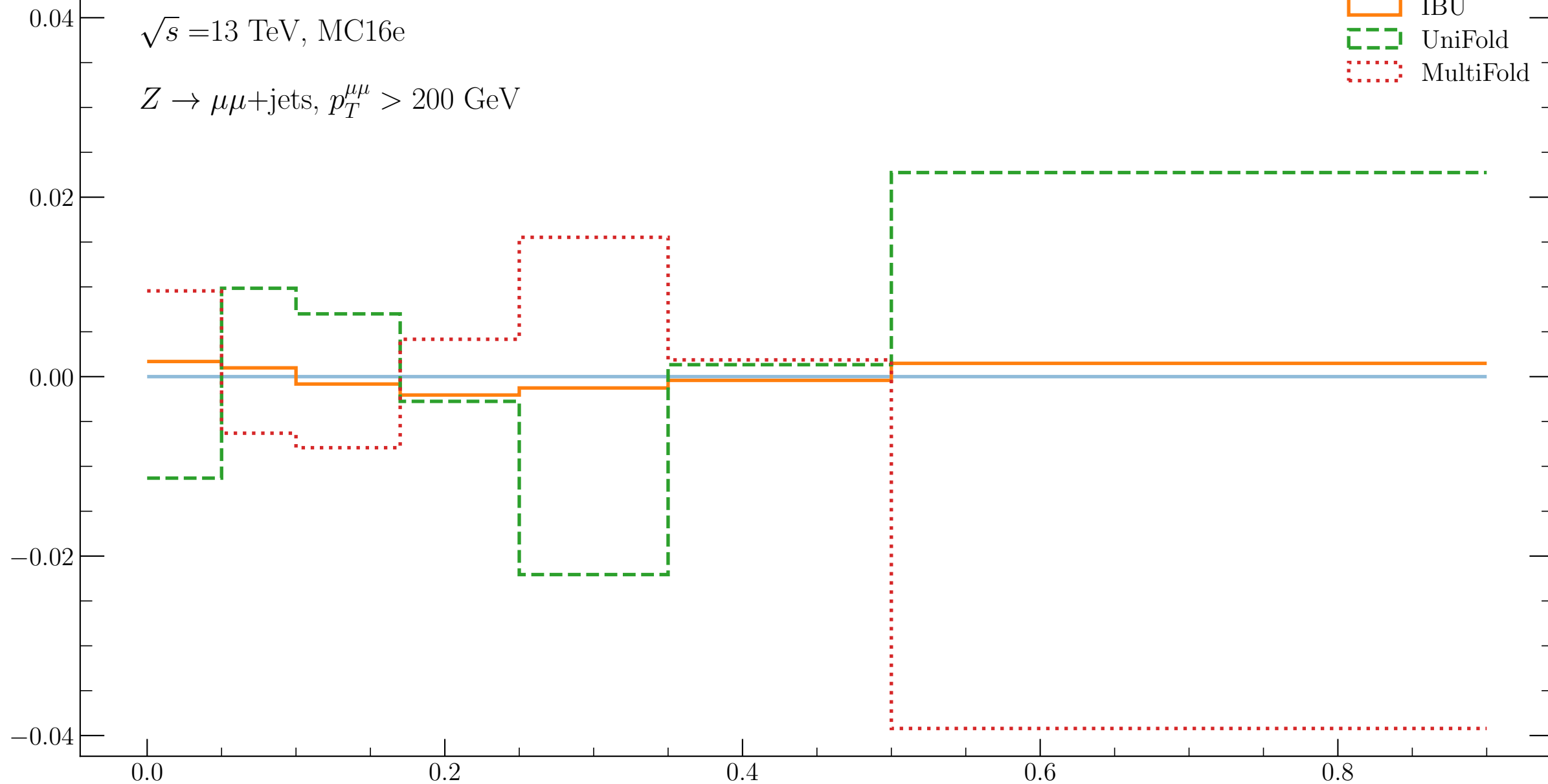
ATLAS

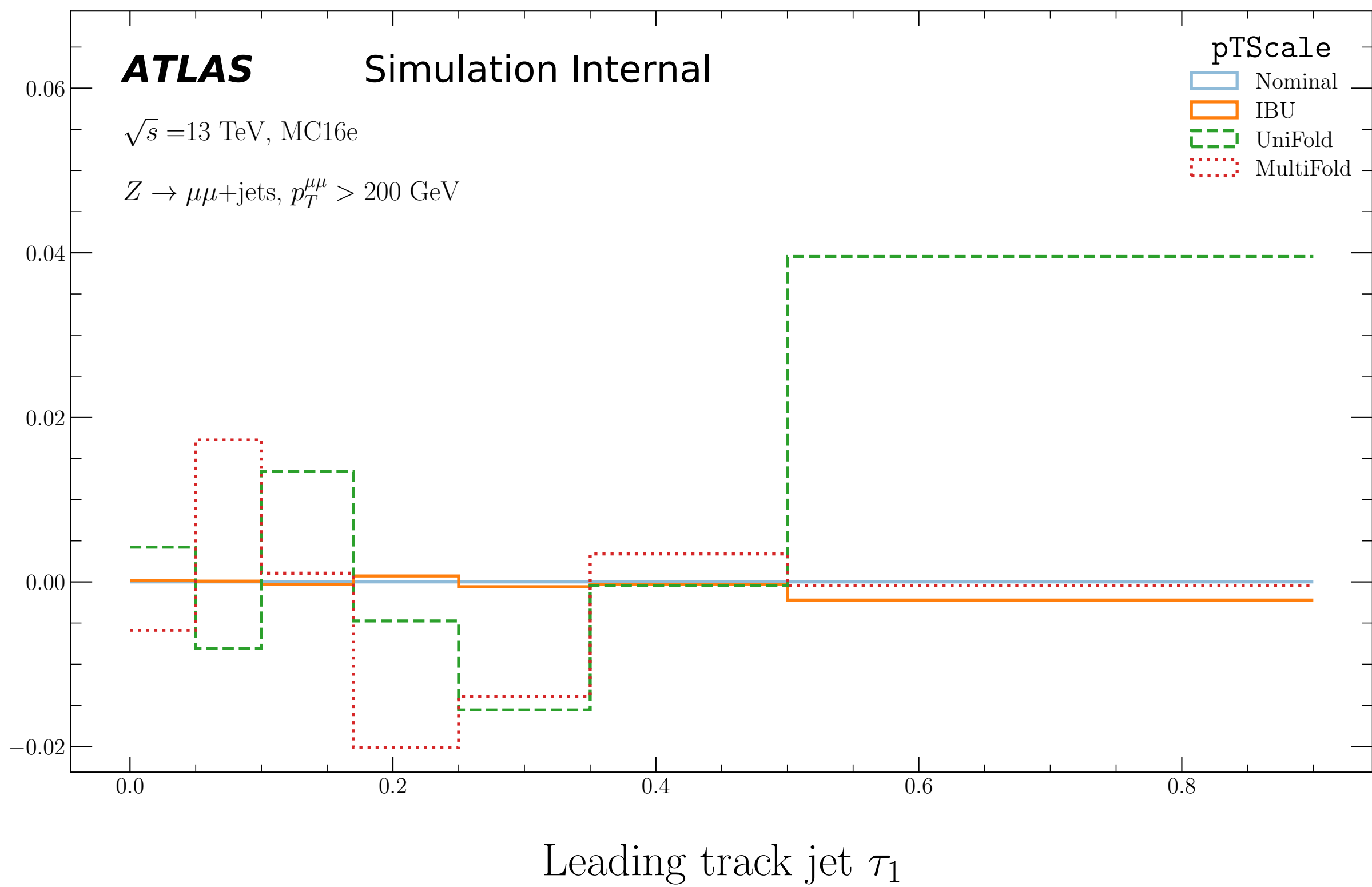
Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet τ_1



ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

TrackFilter

- Nominal
- IBU
- UniFold
- MultiFold

0.150
0.125
0.100
0.075
0.050
0.025
0.000
-0.025

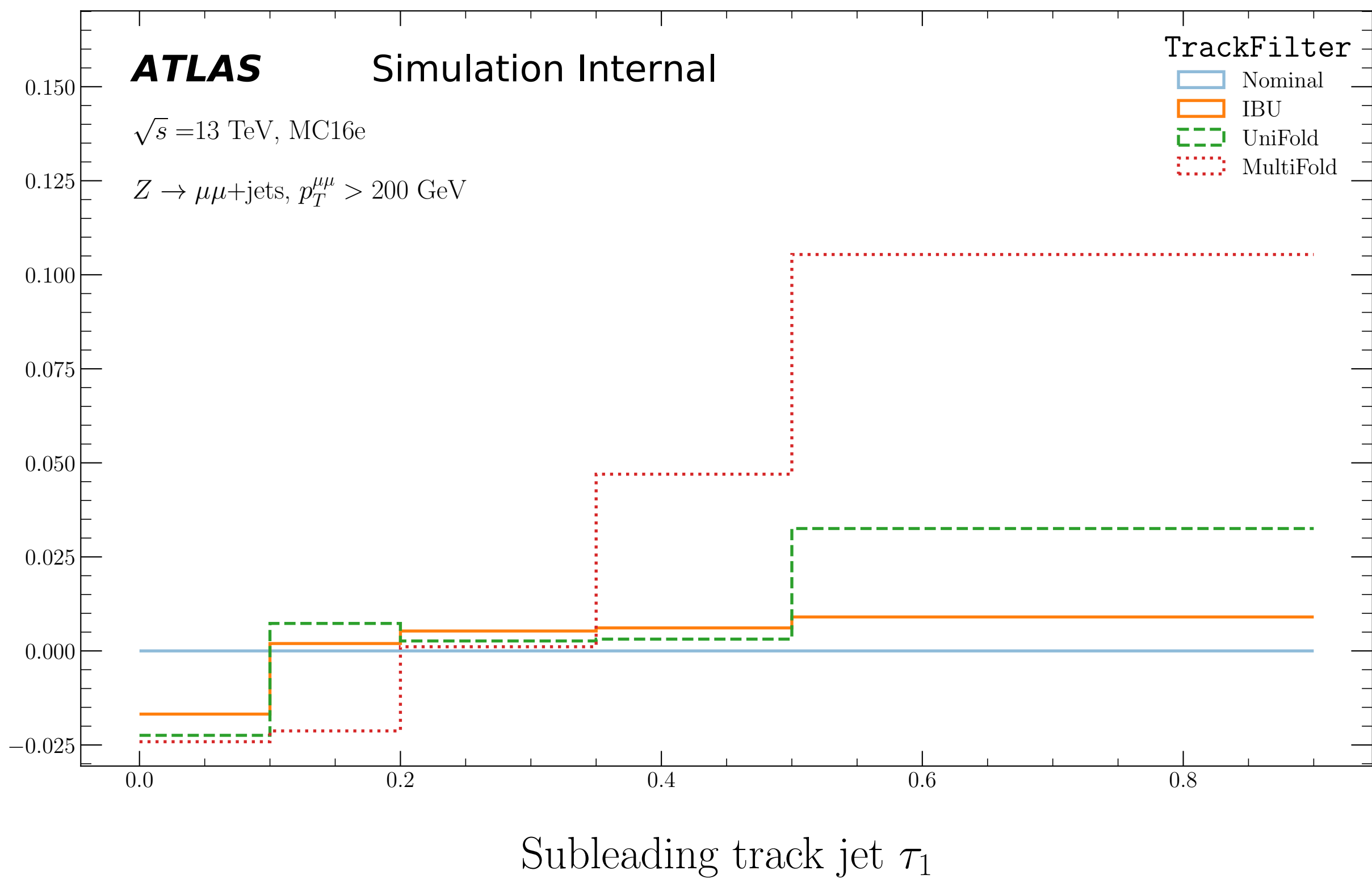
0.0

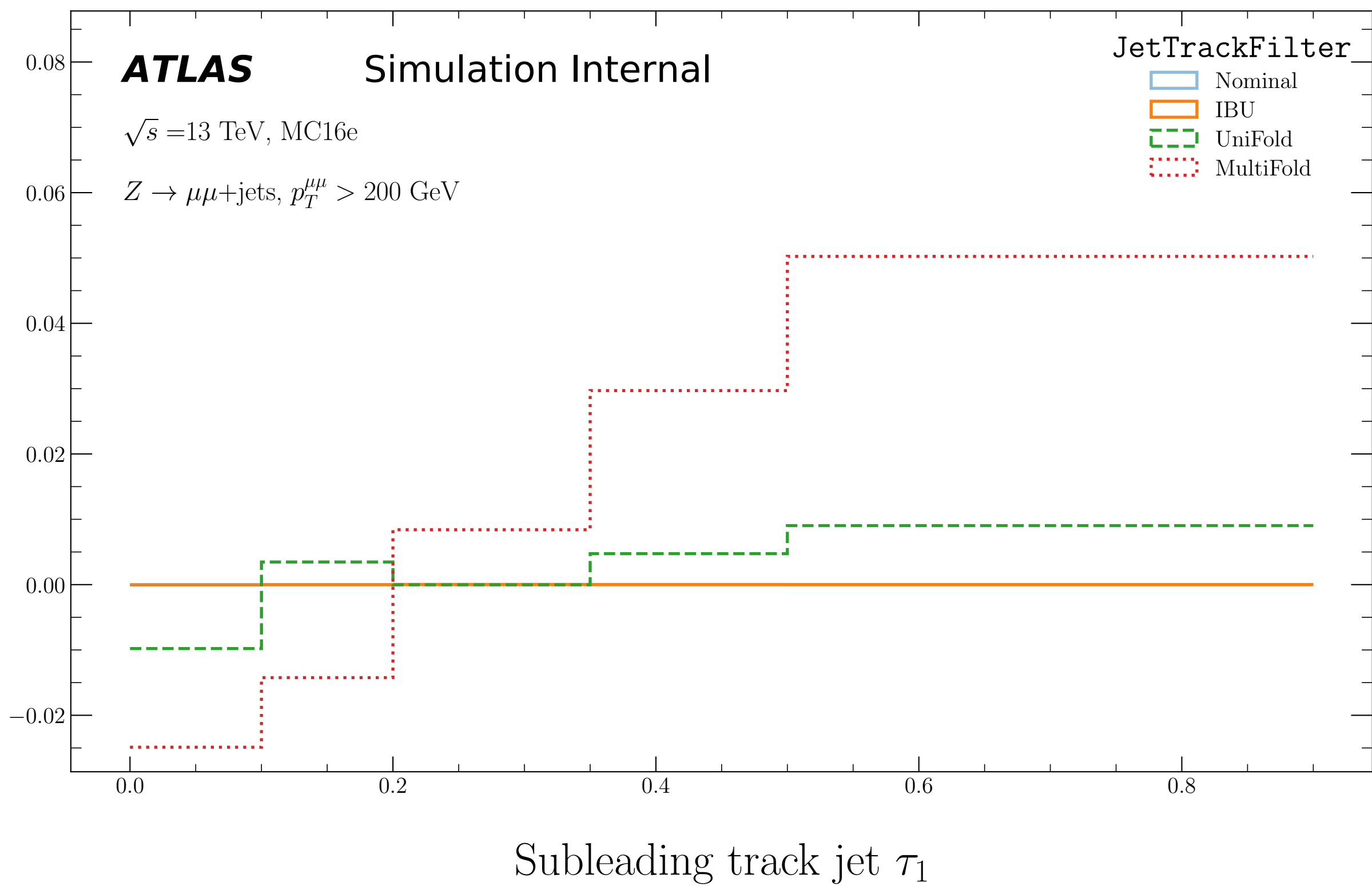
0.2

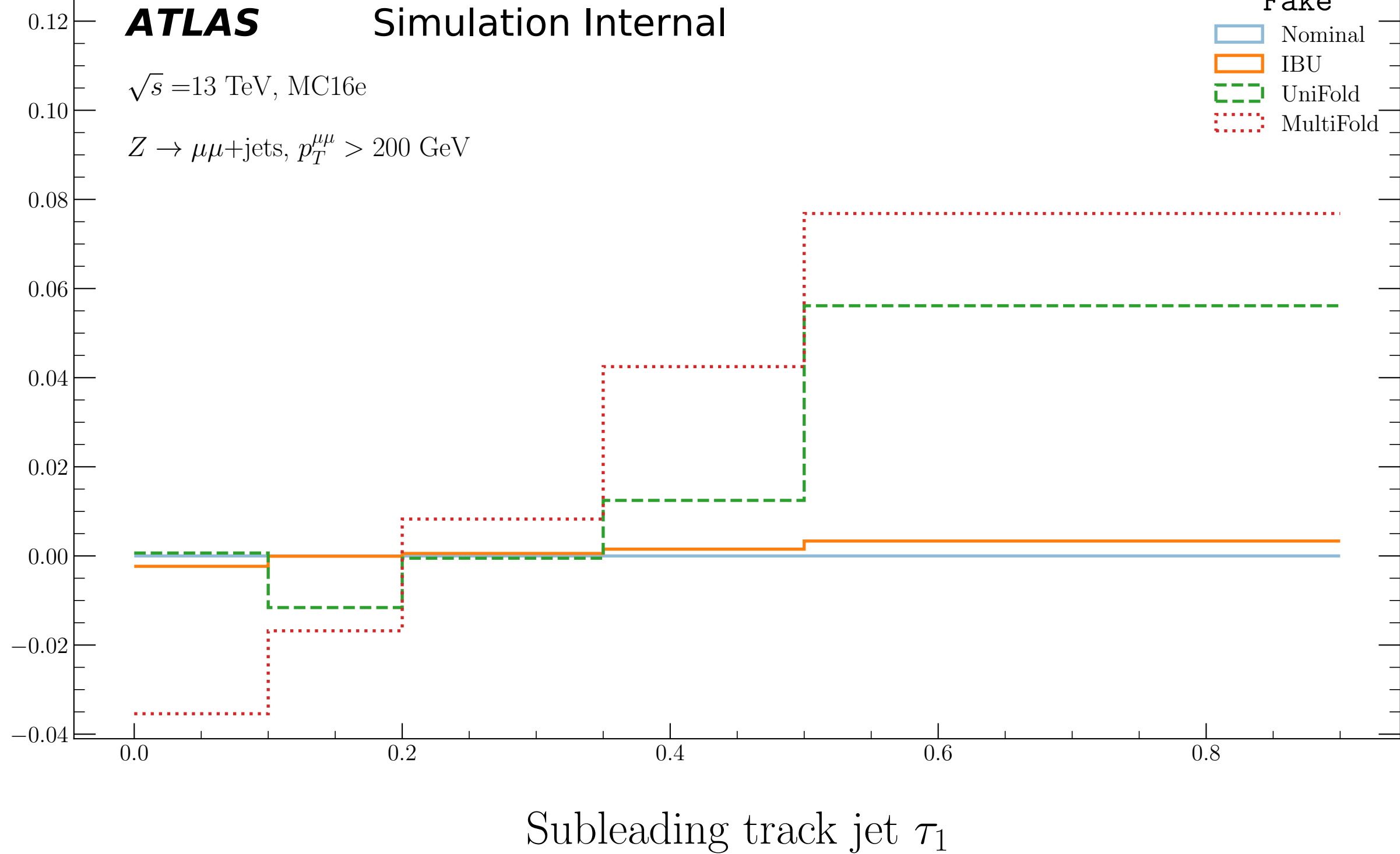
0.4

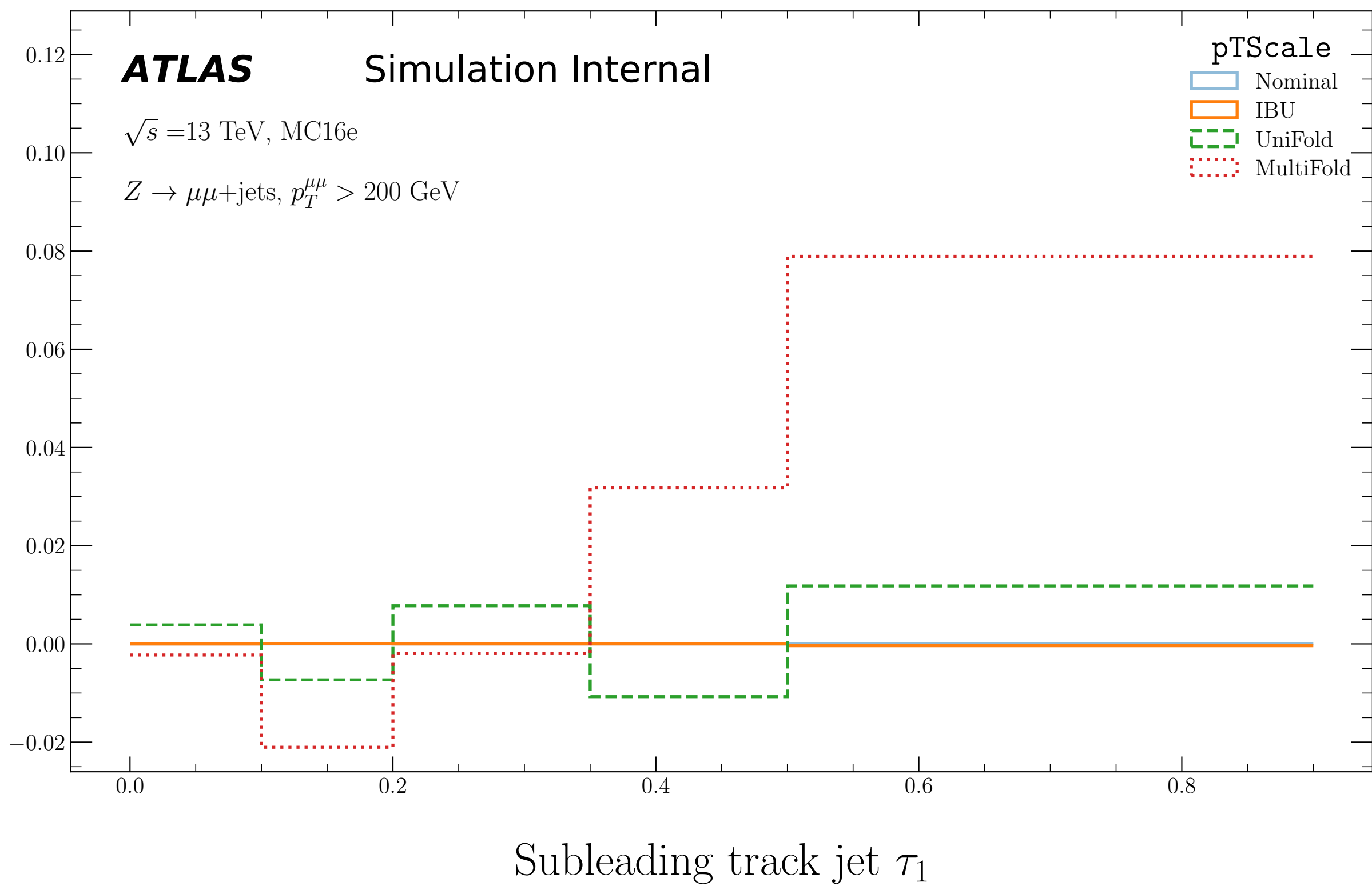
0.6

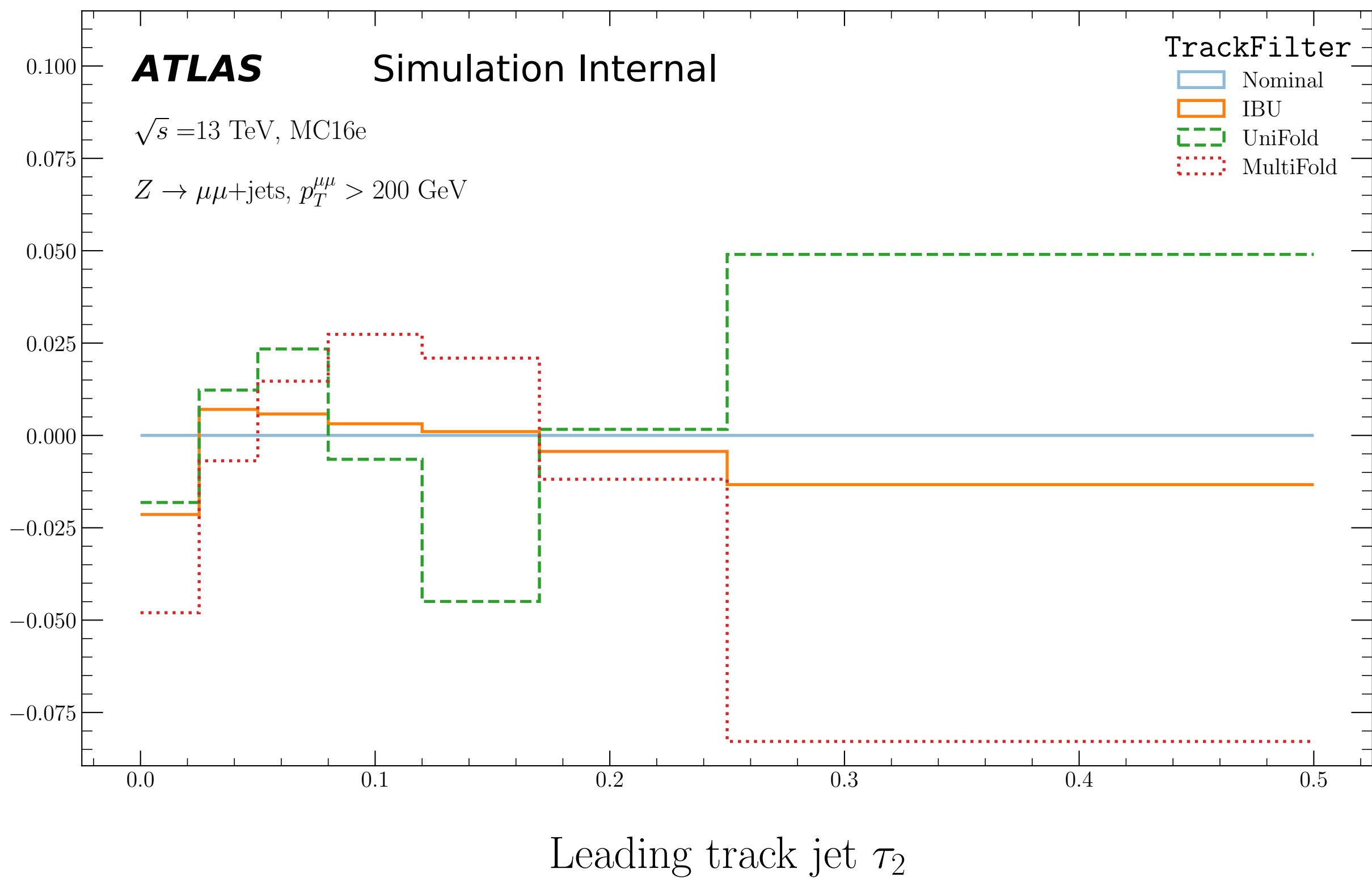
0.8

Subleading track jet τ_1 









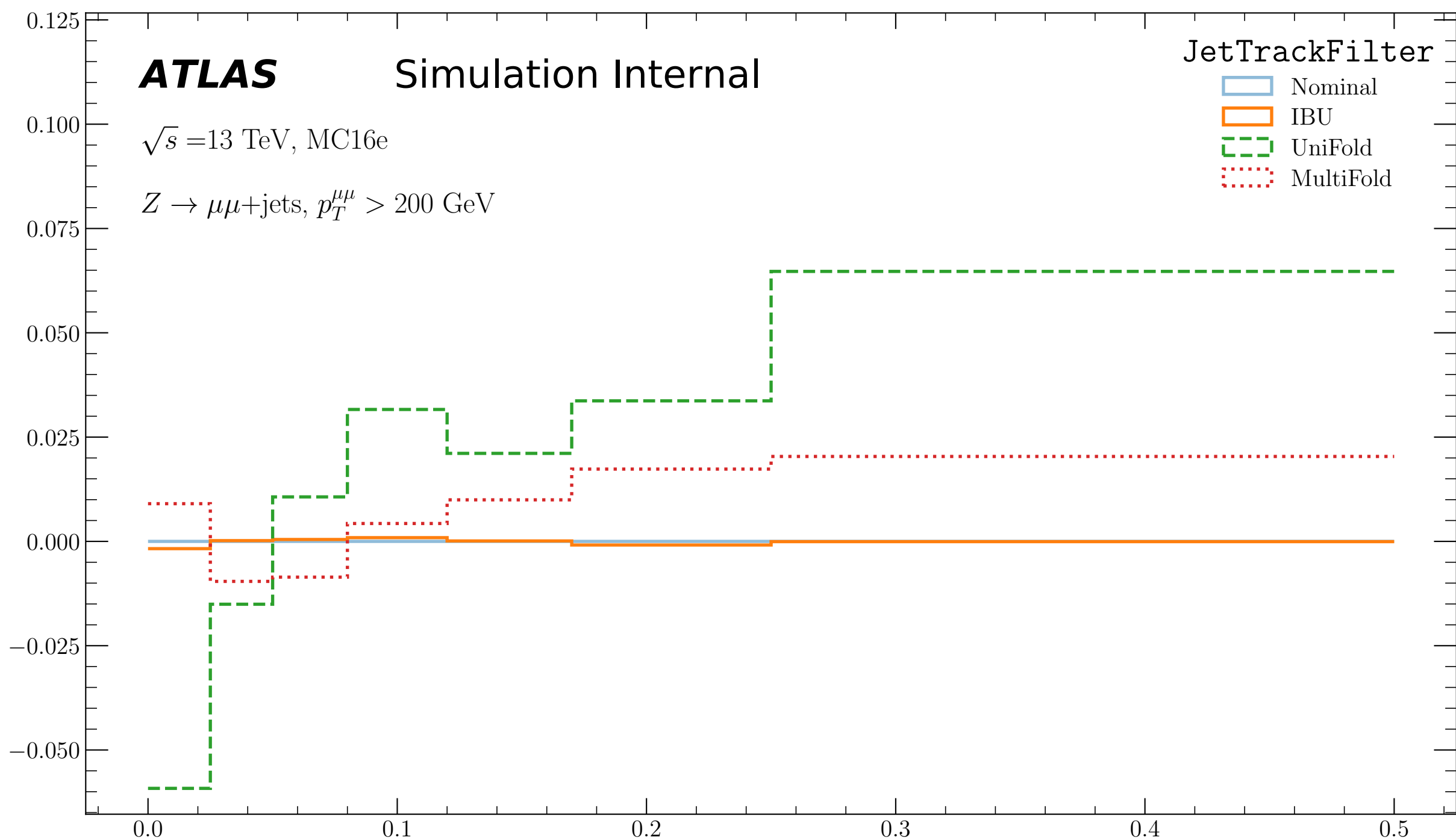
ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet τ_2

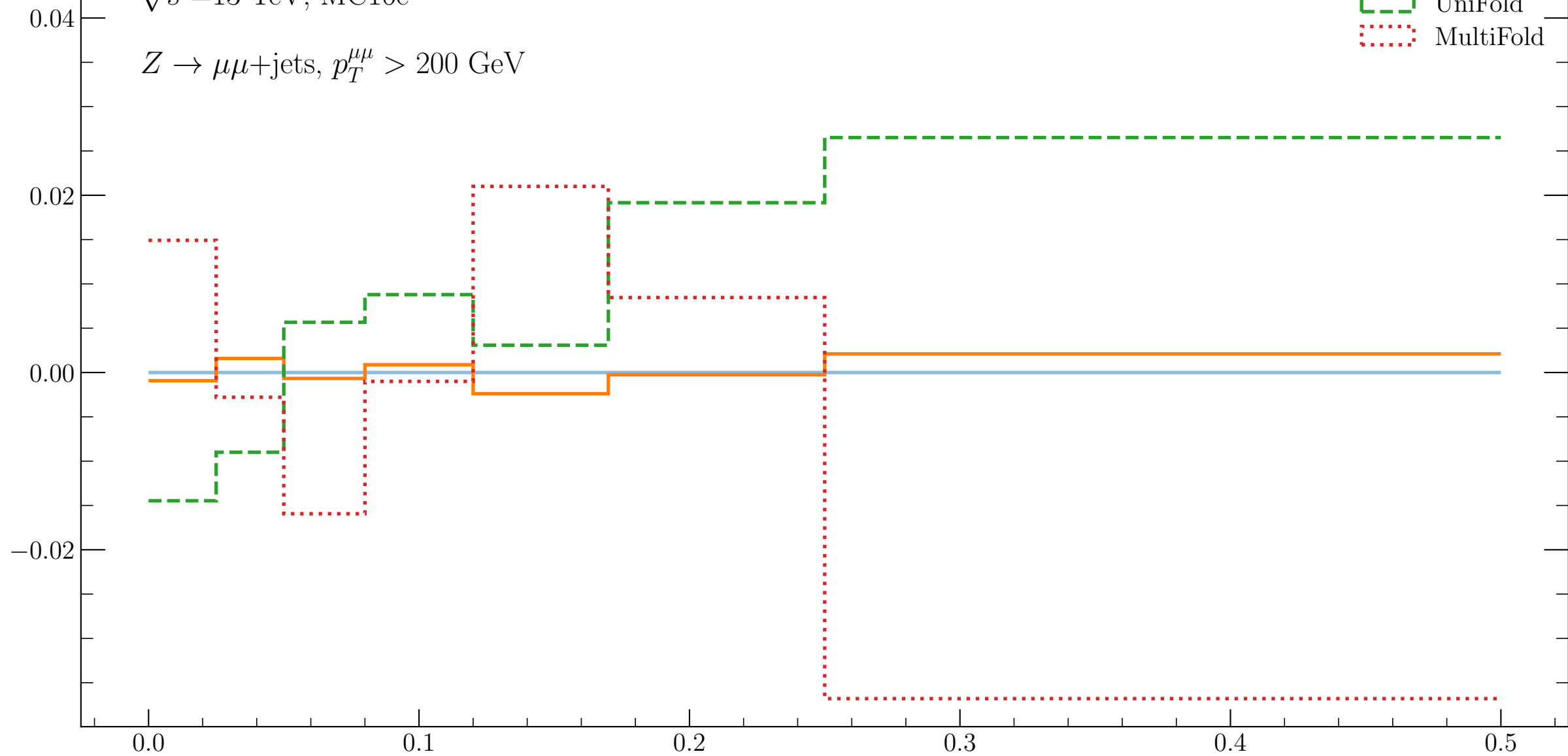
ATLAS

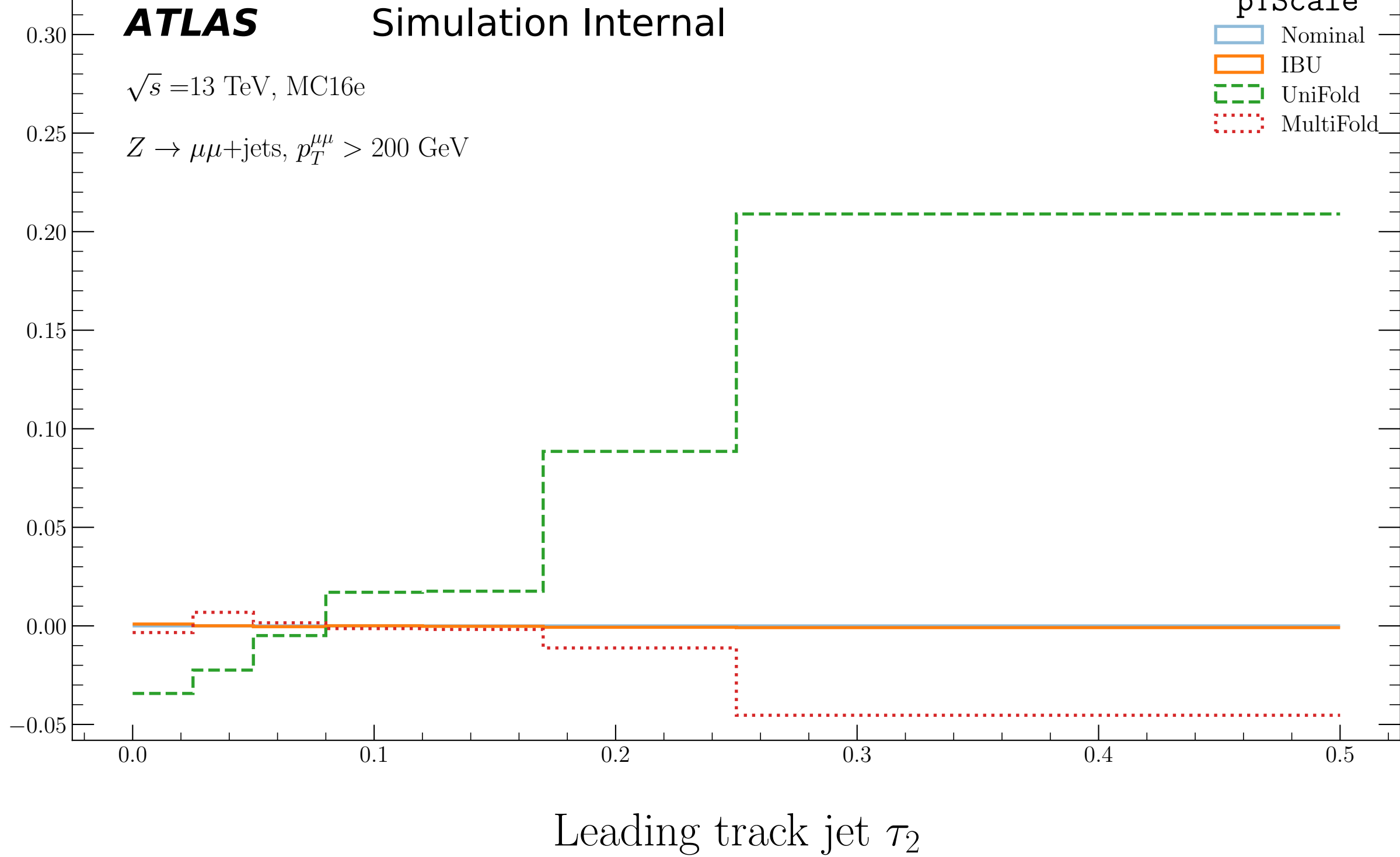
Simulation Internal

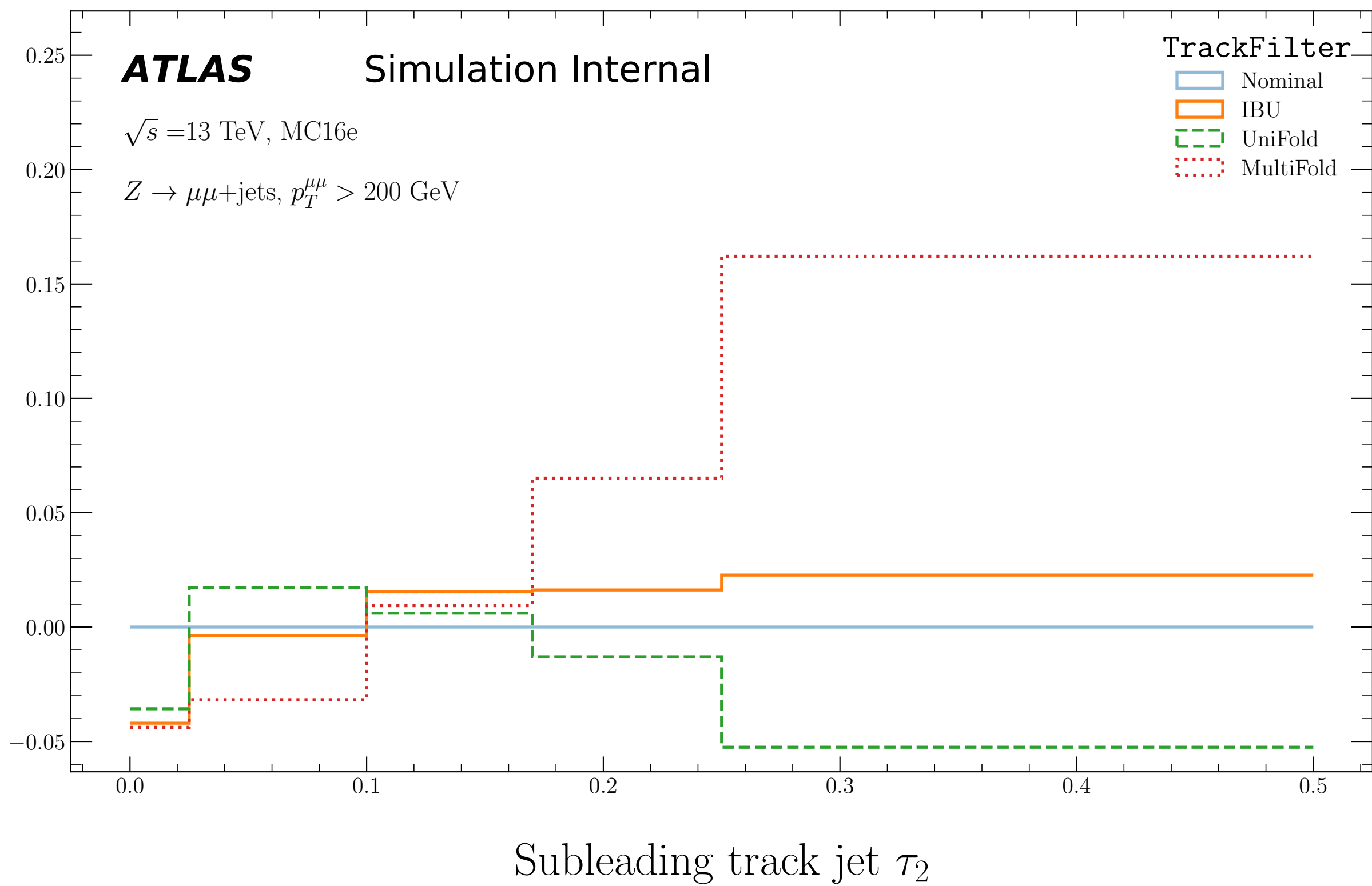
 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet τ_2





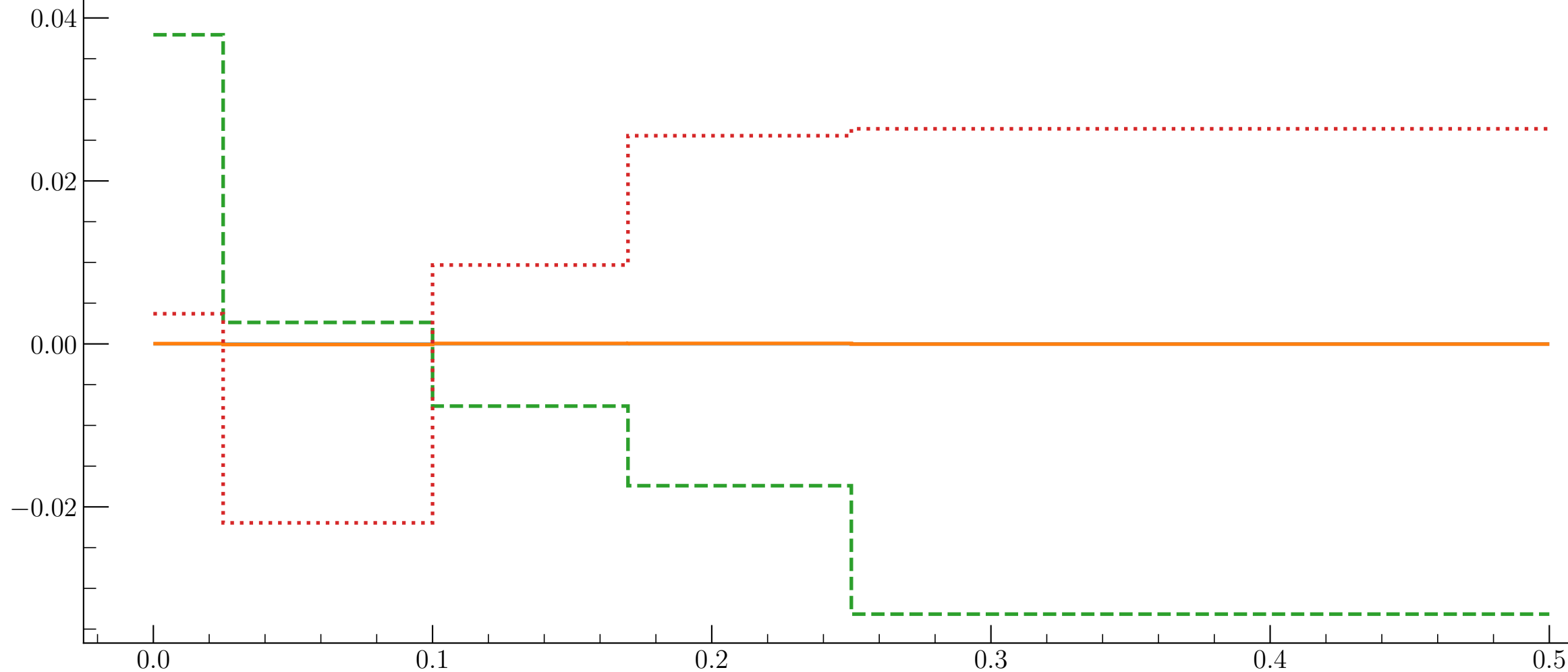
ATLAS

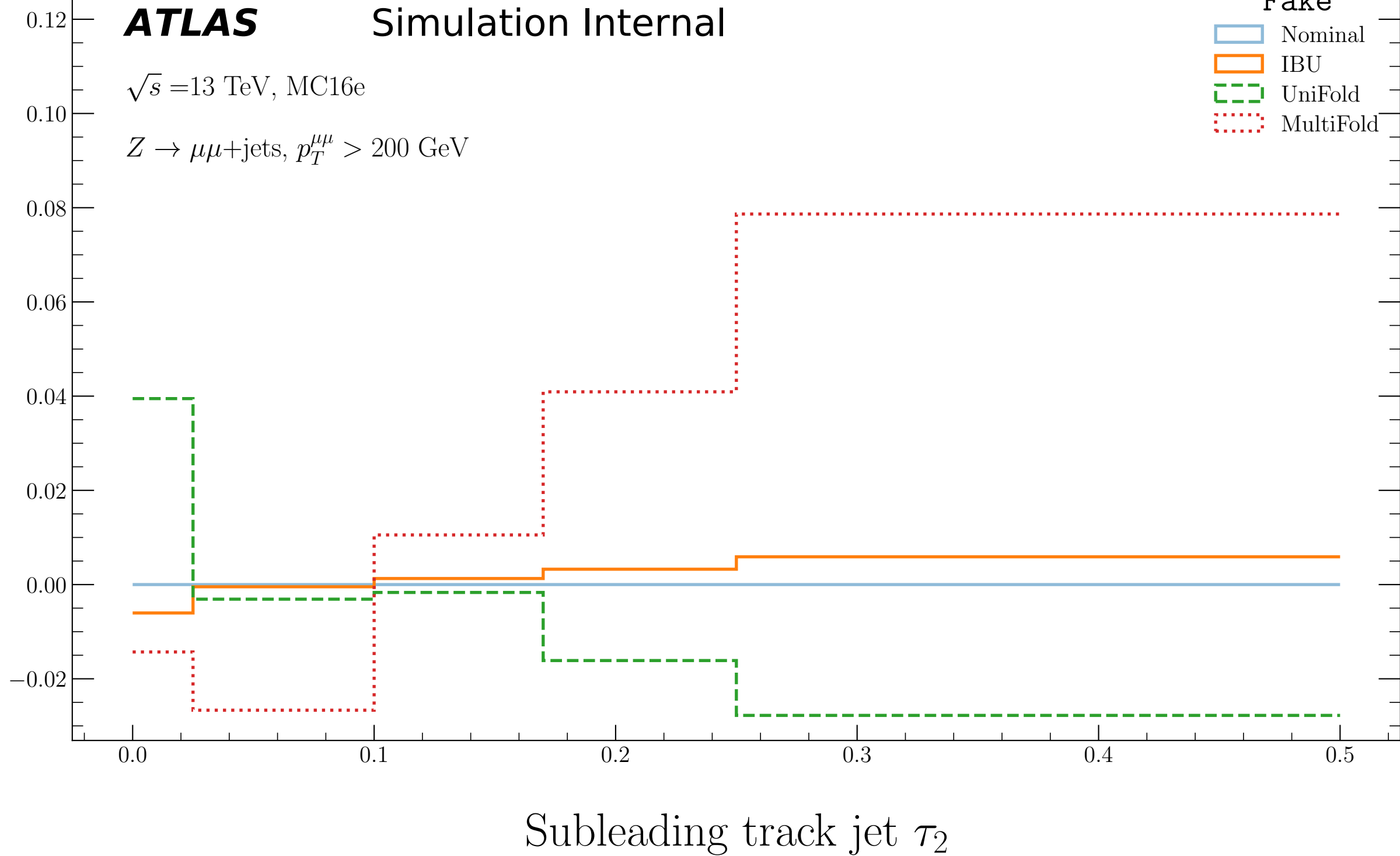
Simulation Internal

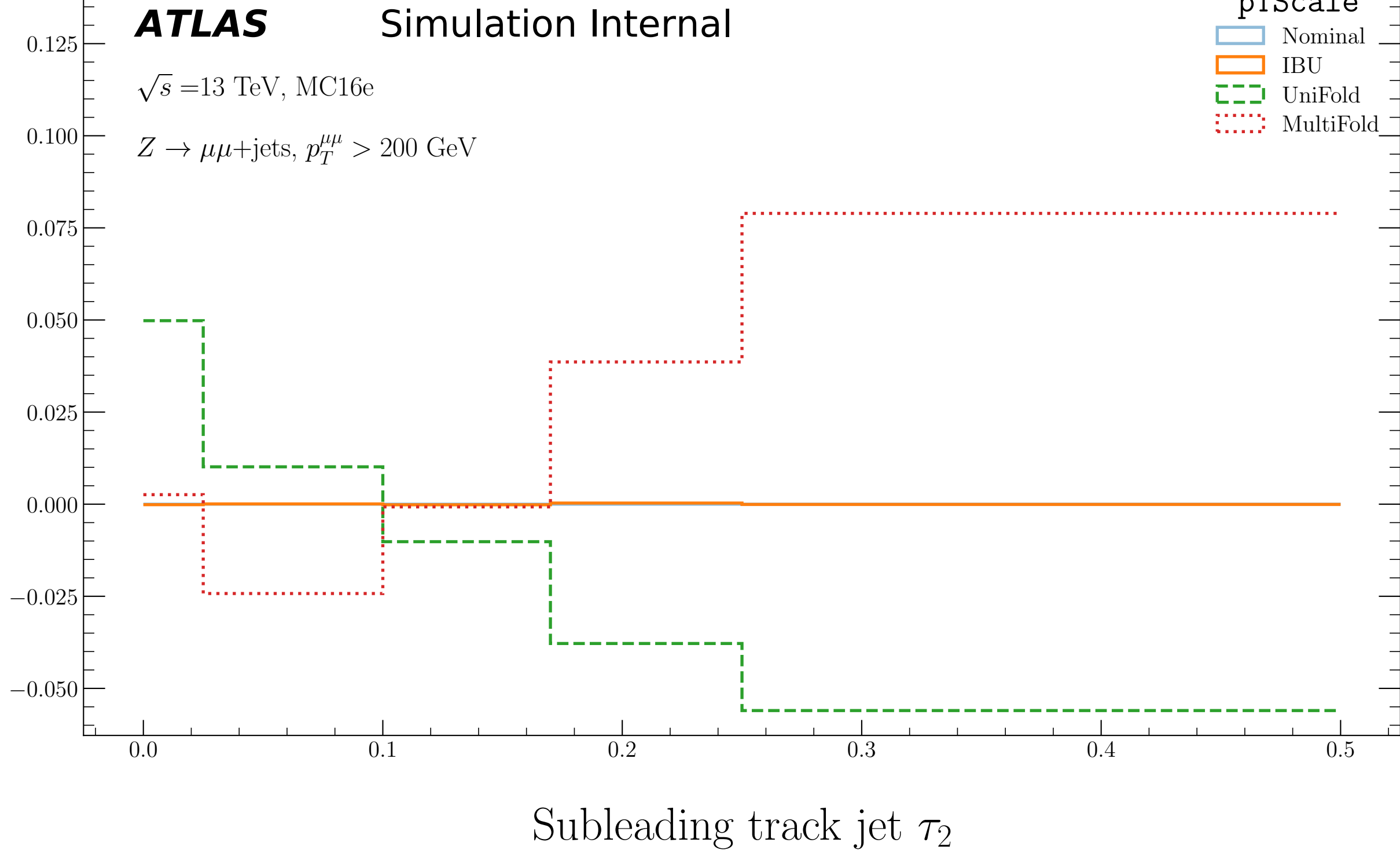
JetTrackFilter

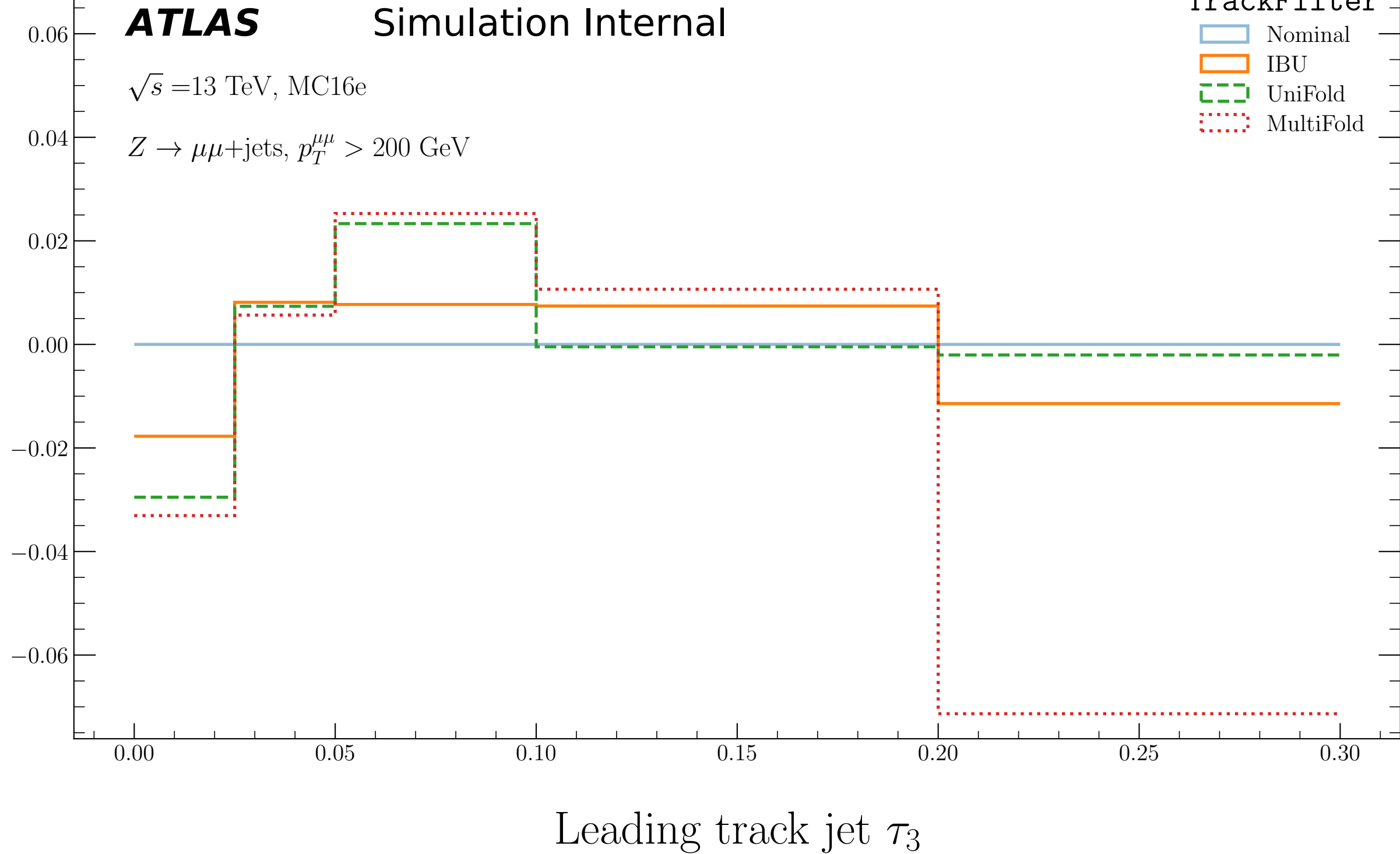
 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

- Nominal
- IBU
- UniFold
- MultiFold

Subleading track jet τ_2







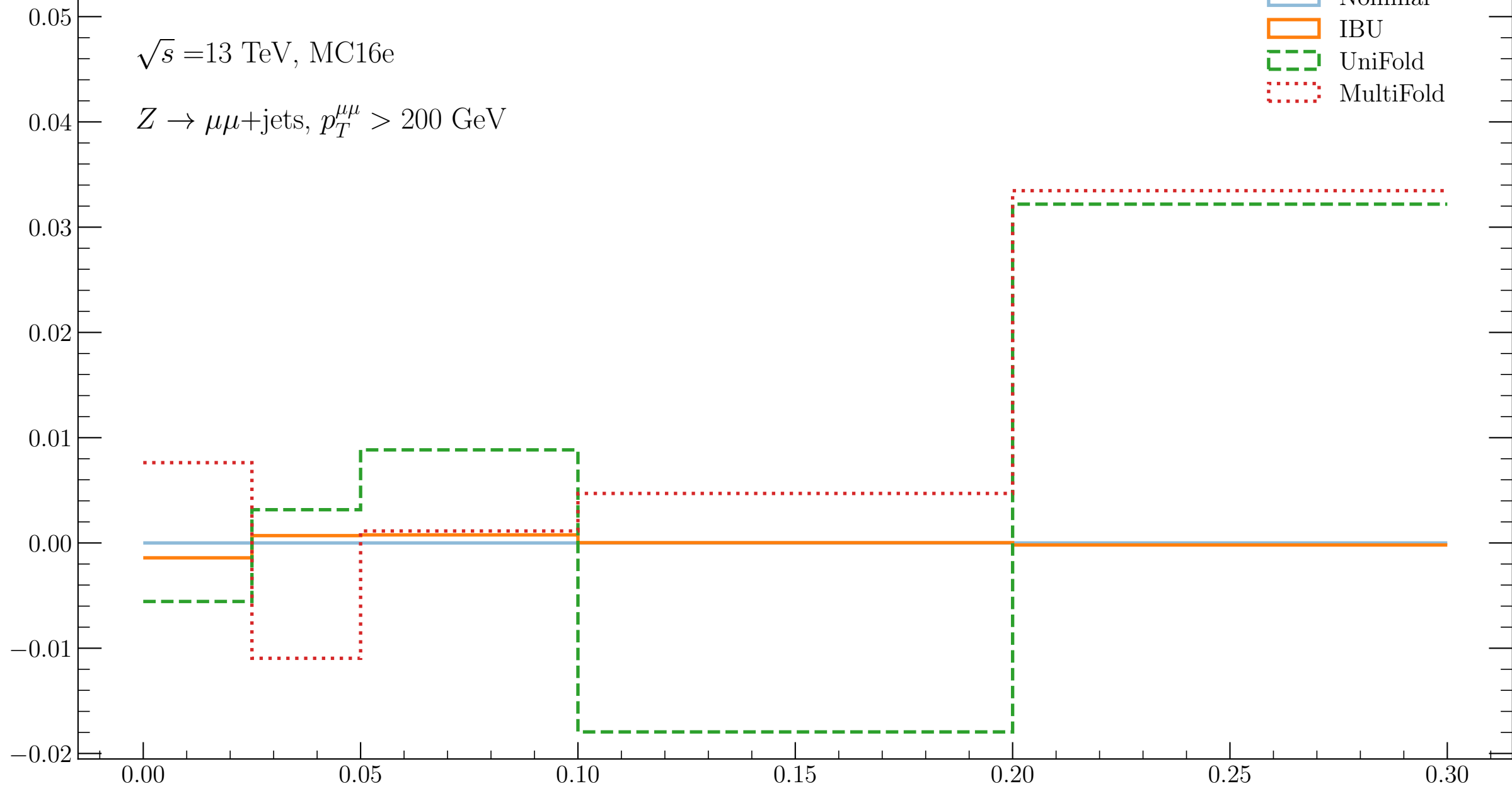
ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet τ_3

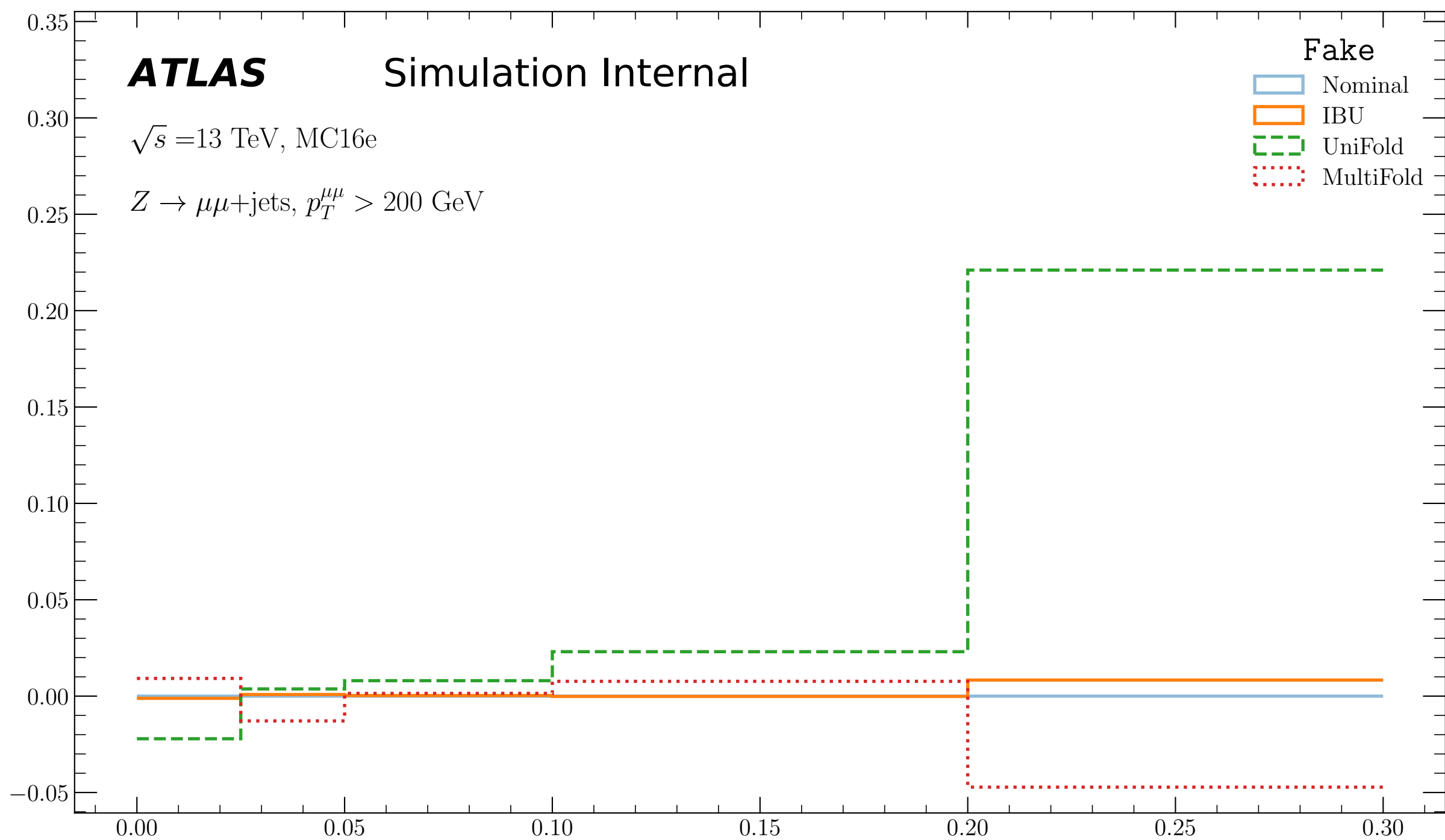
ATLAS

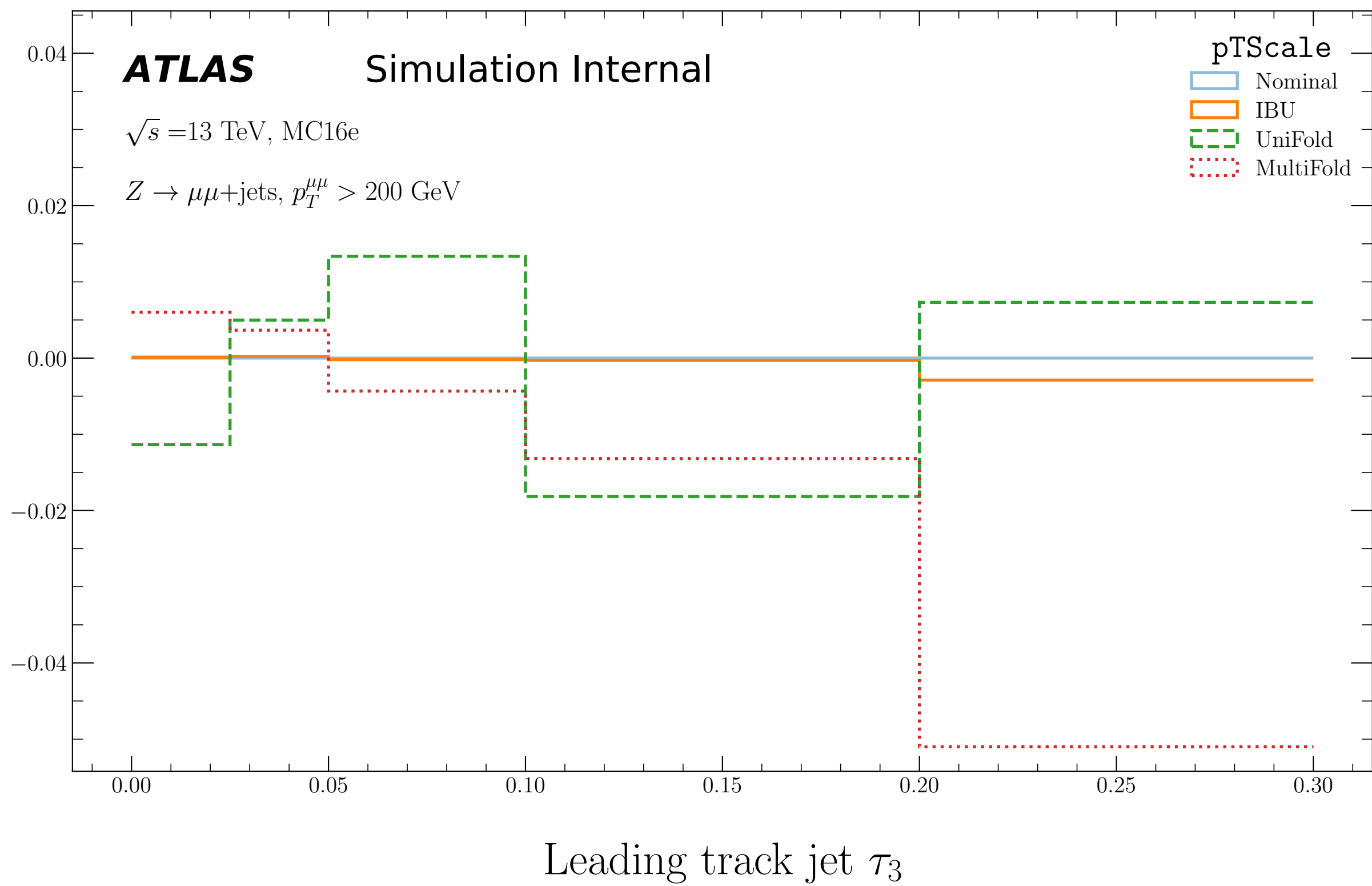
Simulation Internal

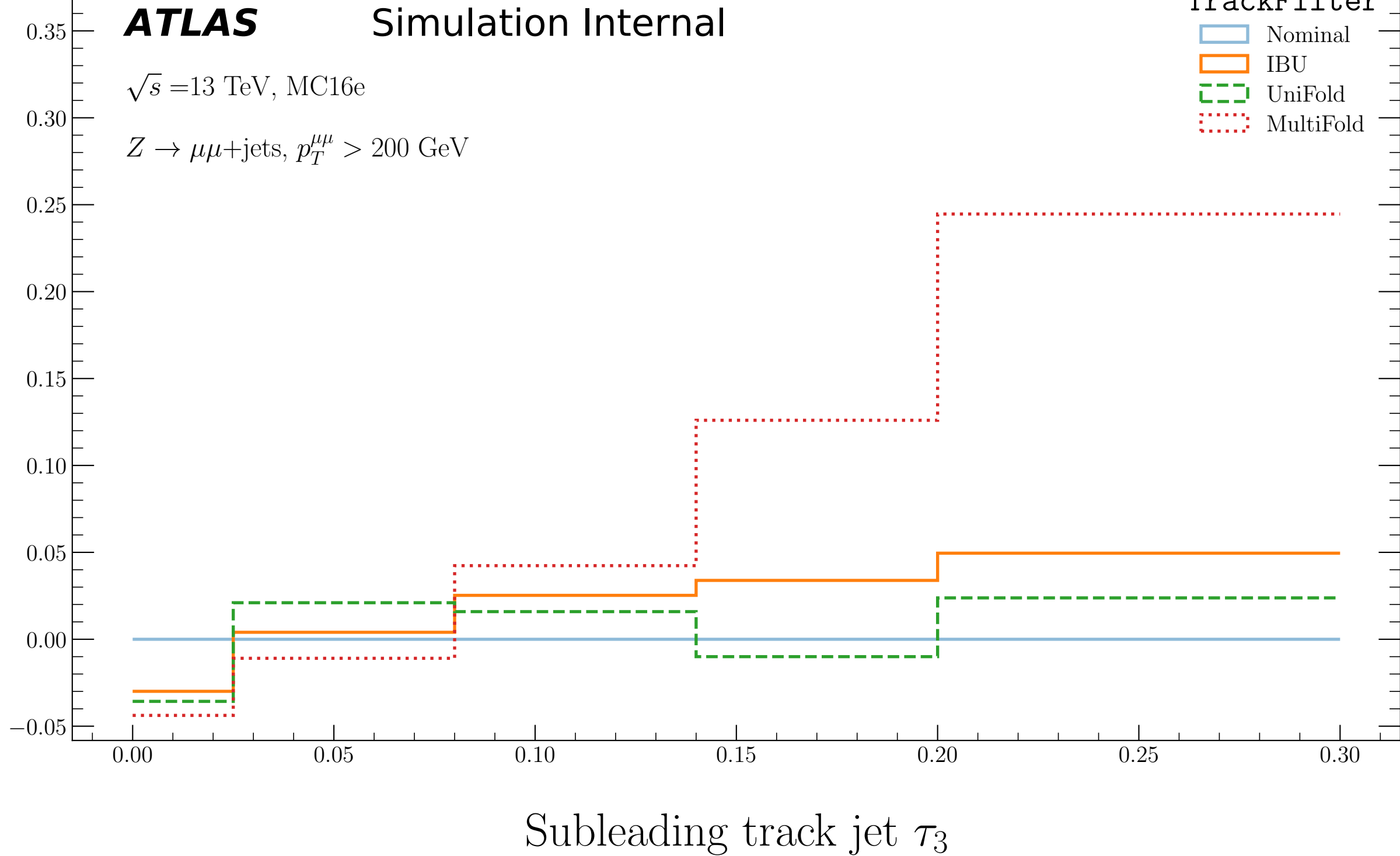
 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold

Leading track jet τ_3





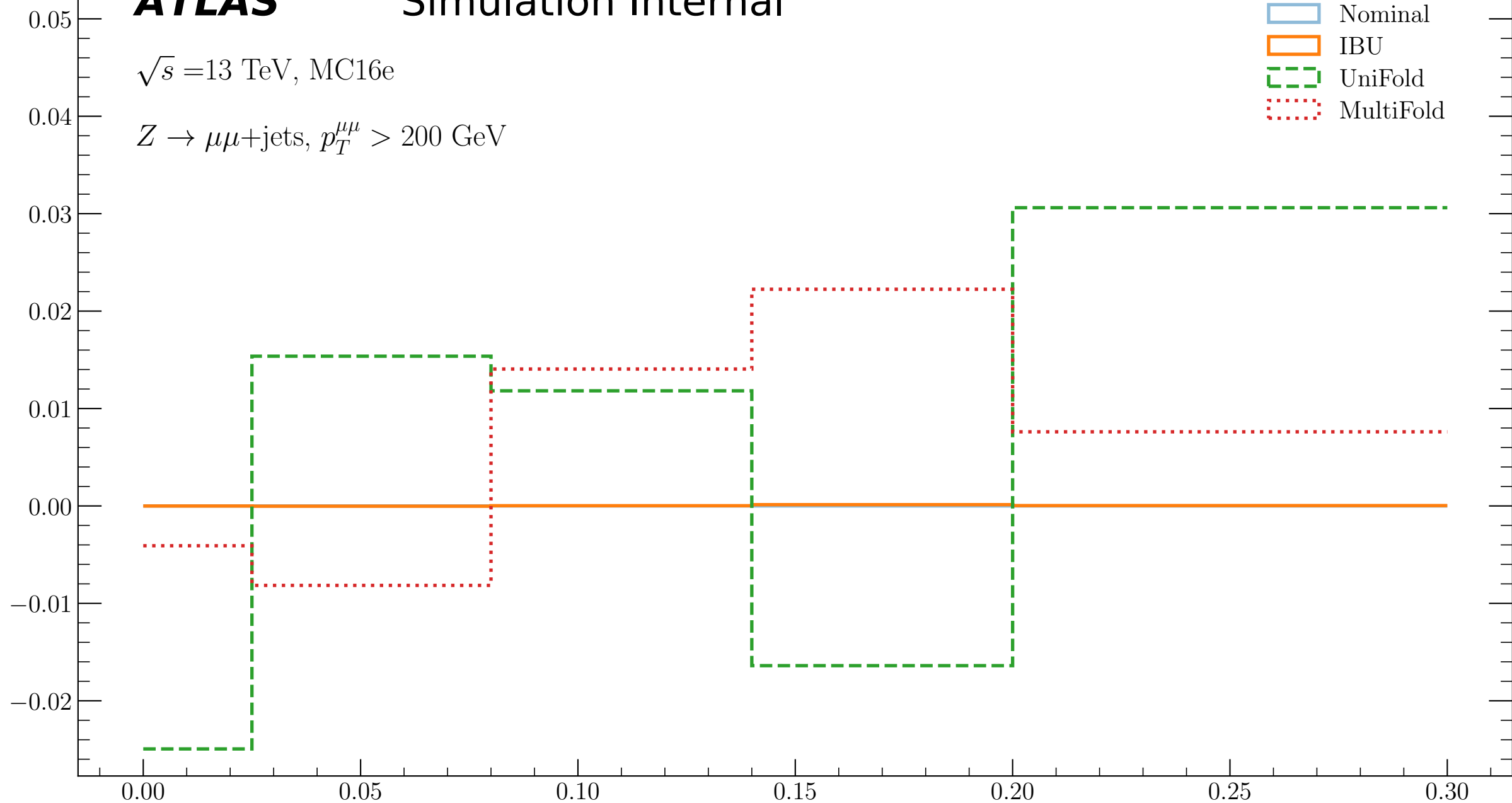
ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

- Nominal
- IBU
- UniFold
- MultiFold

Subleading track jet τ_3

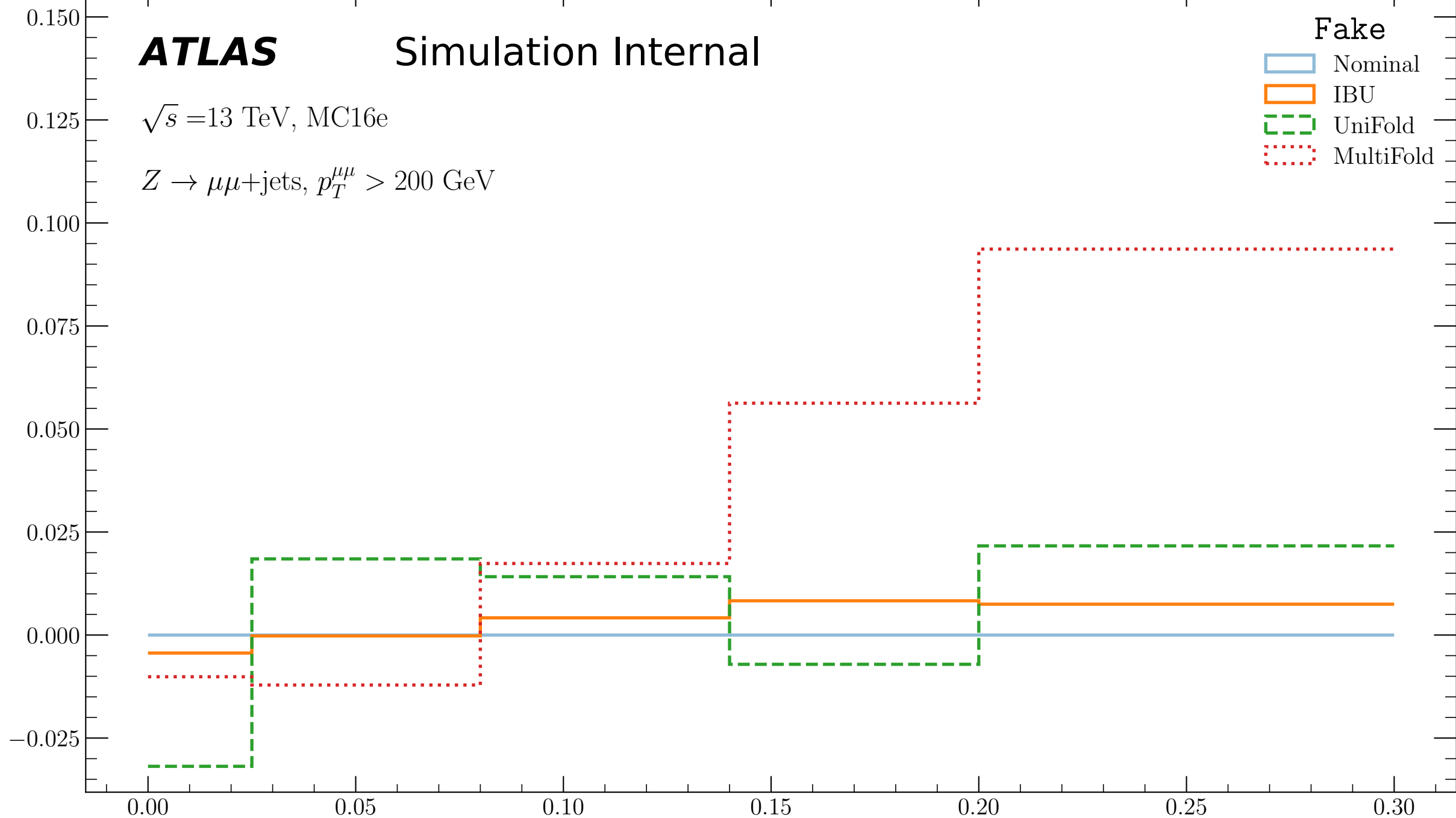
ATLAS

Simulation Internal

 $\sqrt{s}=13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

- Nominal
- IBU
- UniFold
- MultiFold

Subleading track jet τ_3

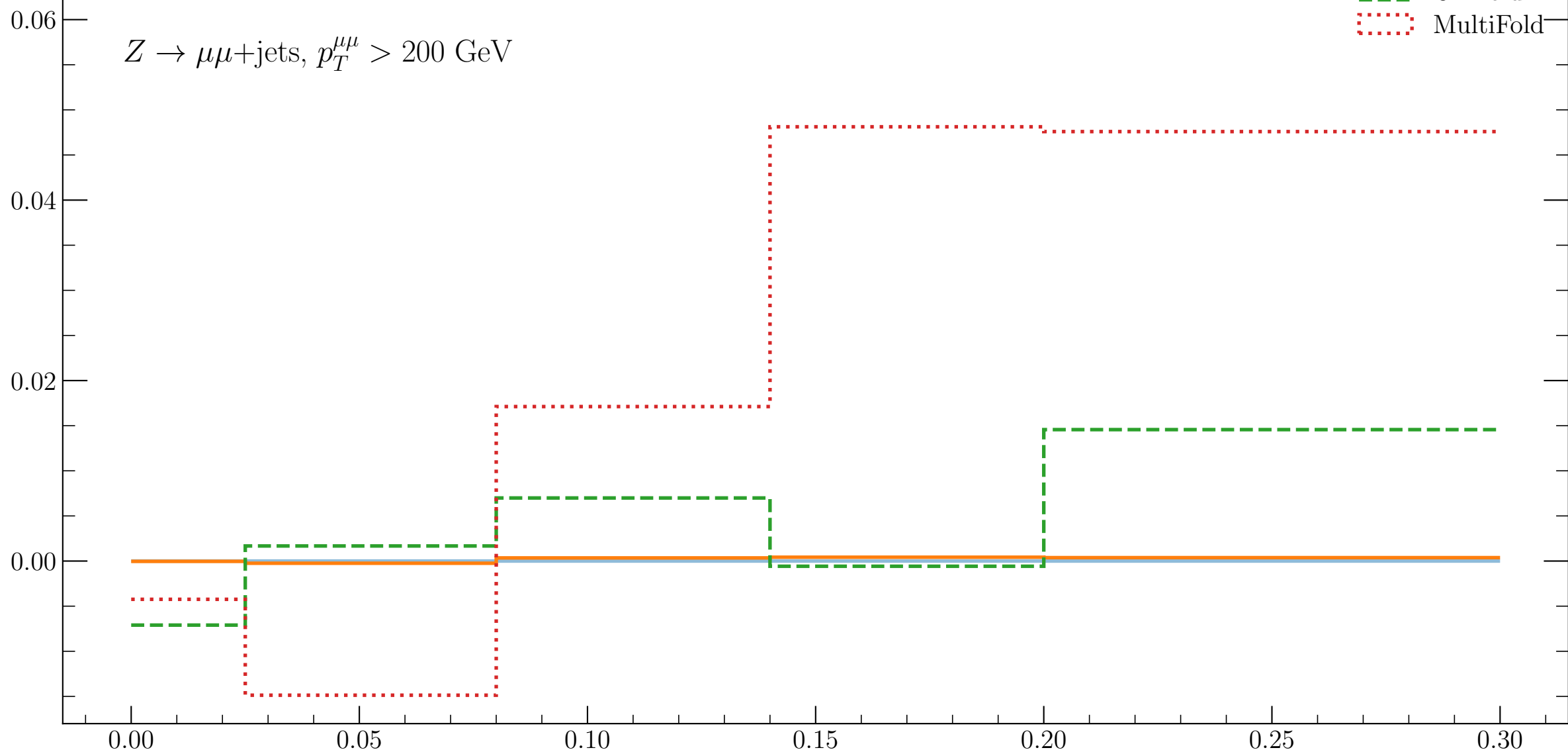
ATLAS

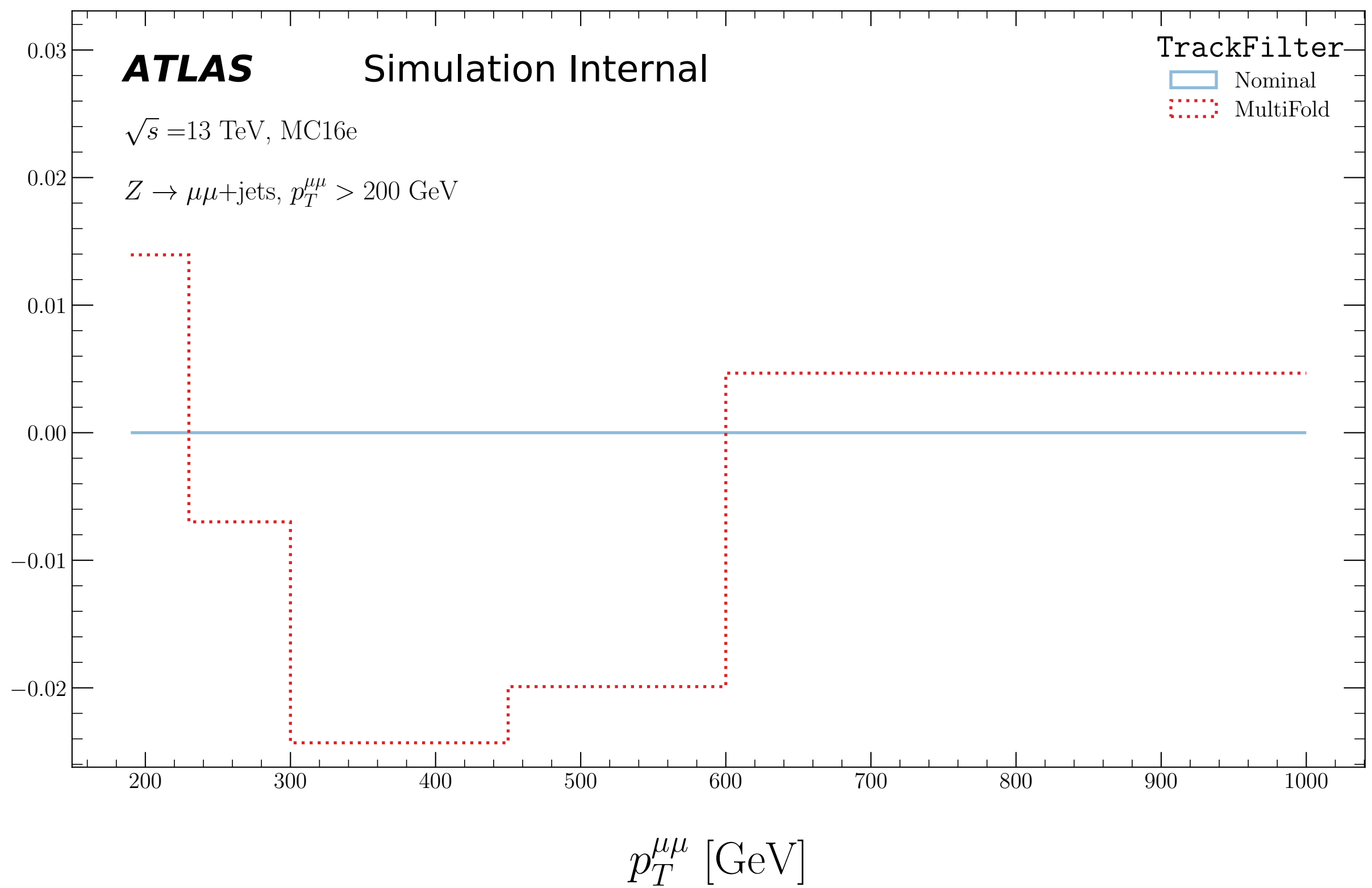
Simulation Internal

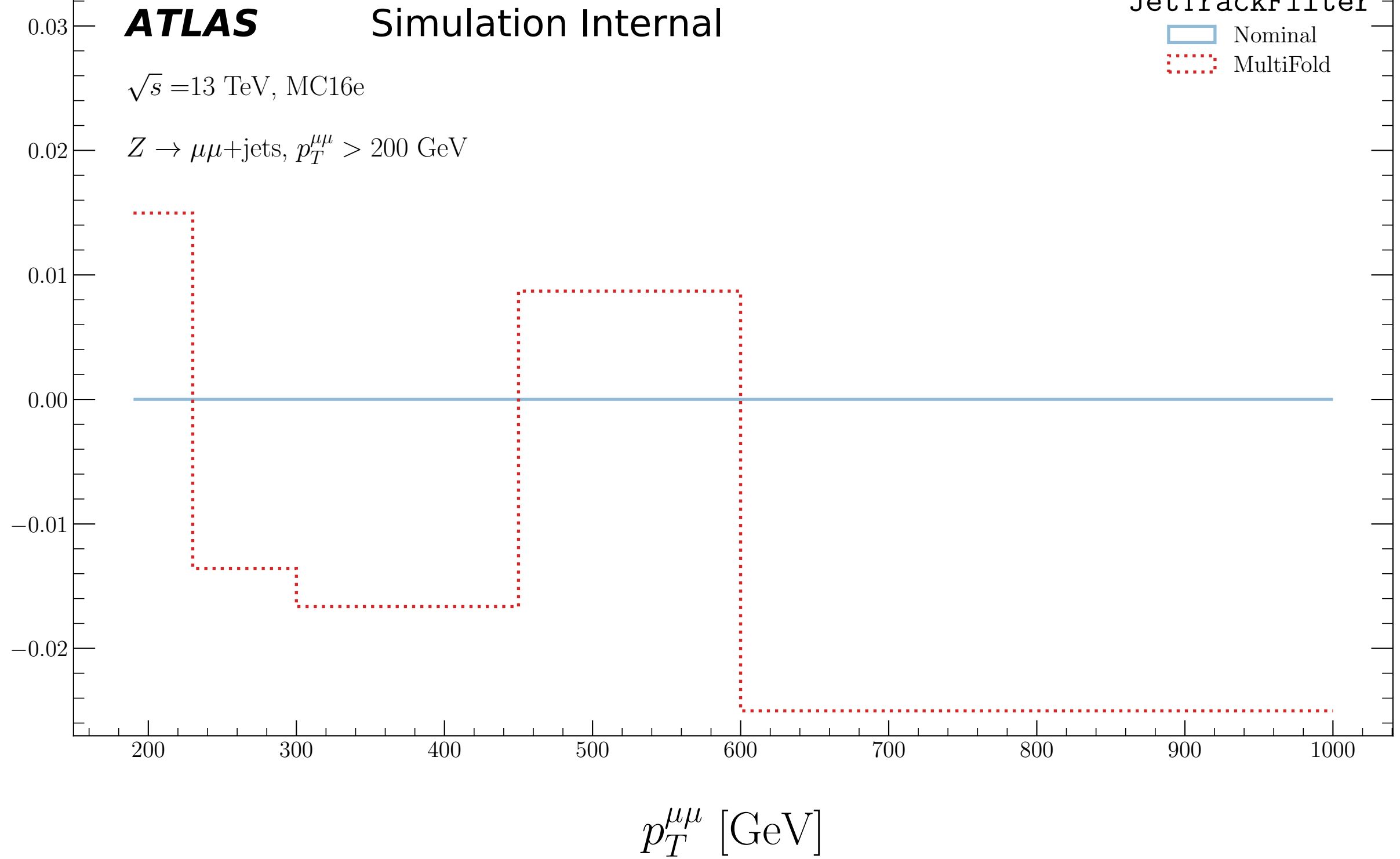
 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

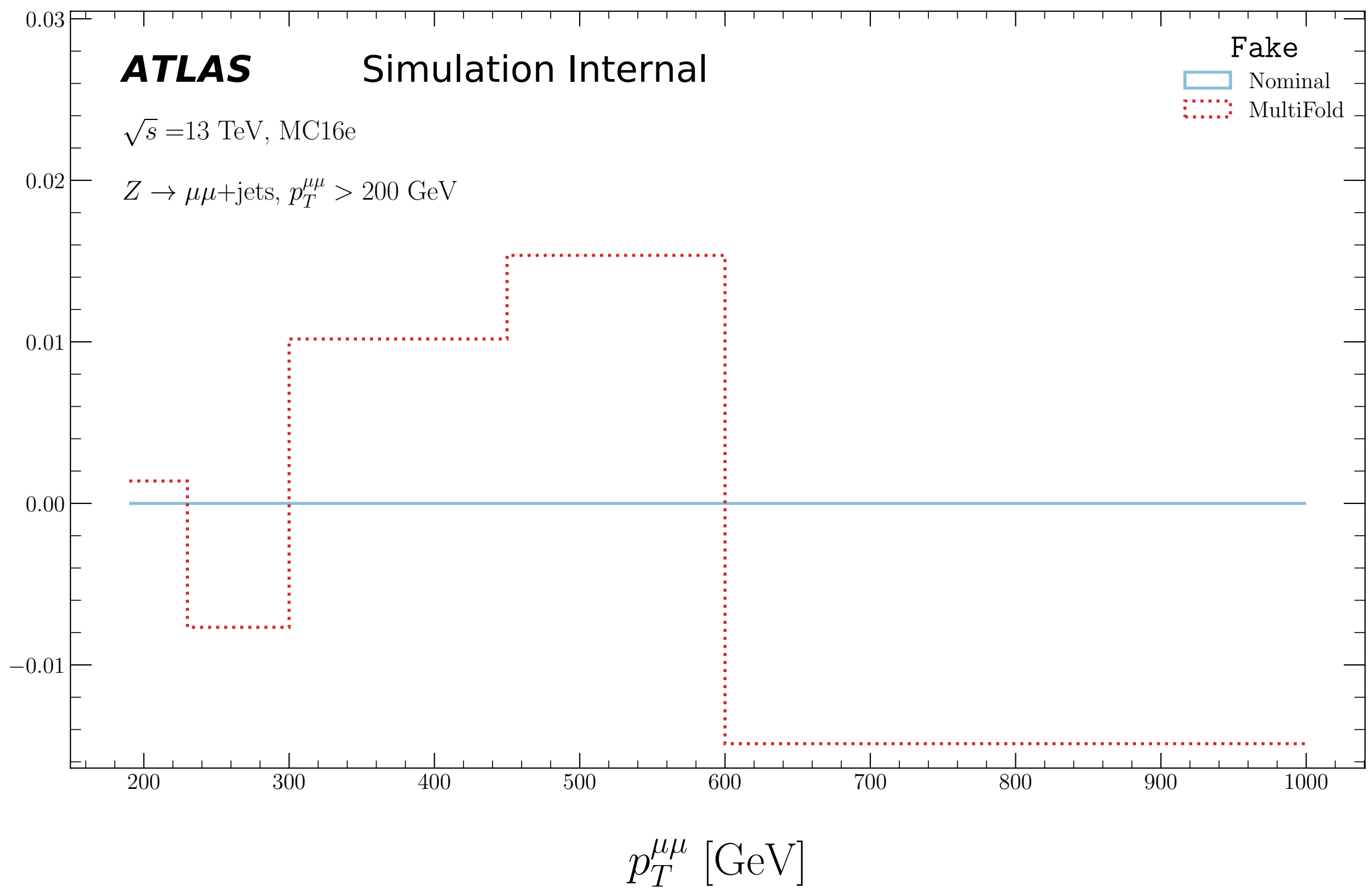
pTScale

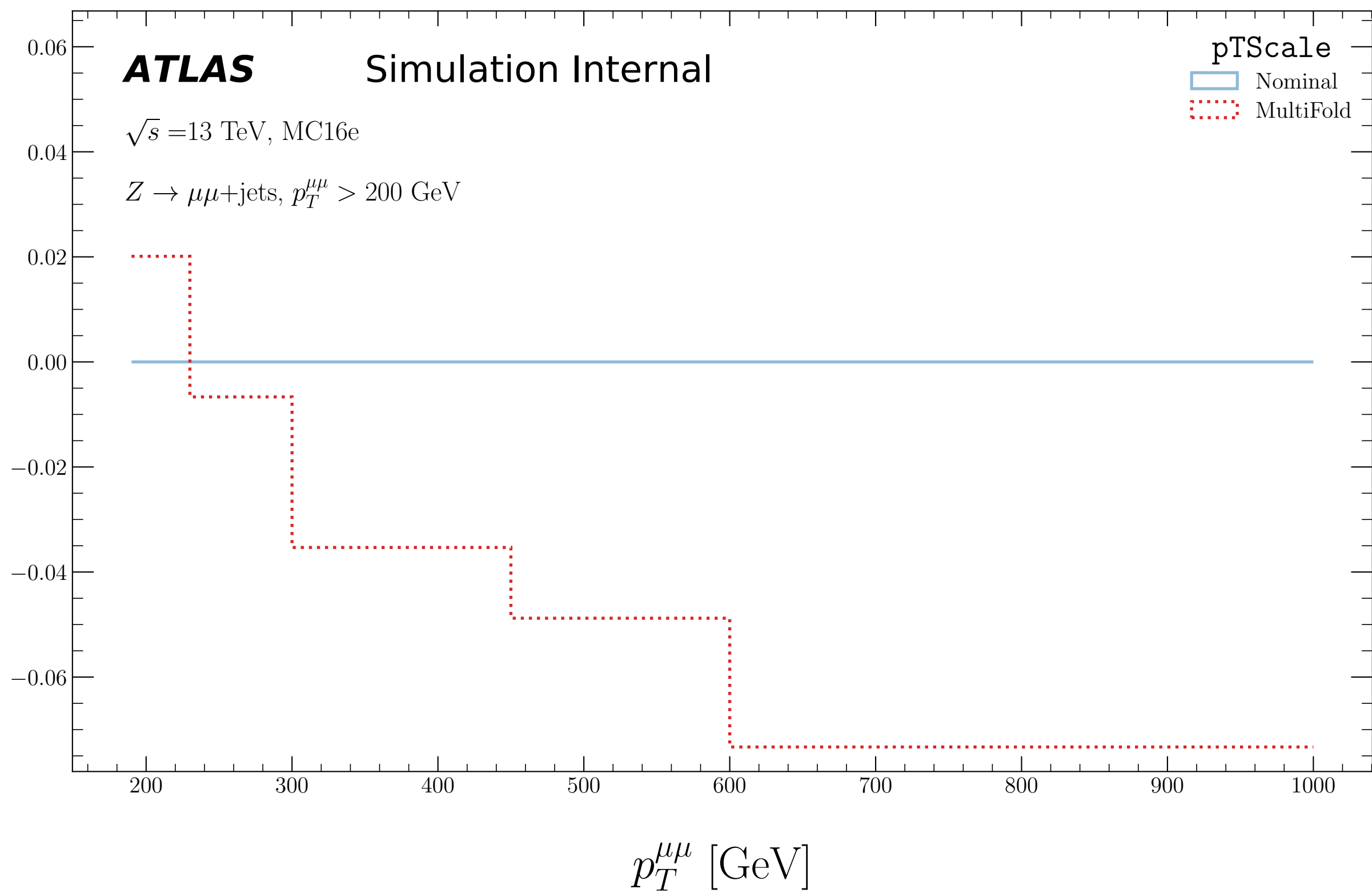
- Nominal
- IBU
- UniFold
- MultiFold

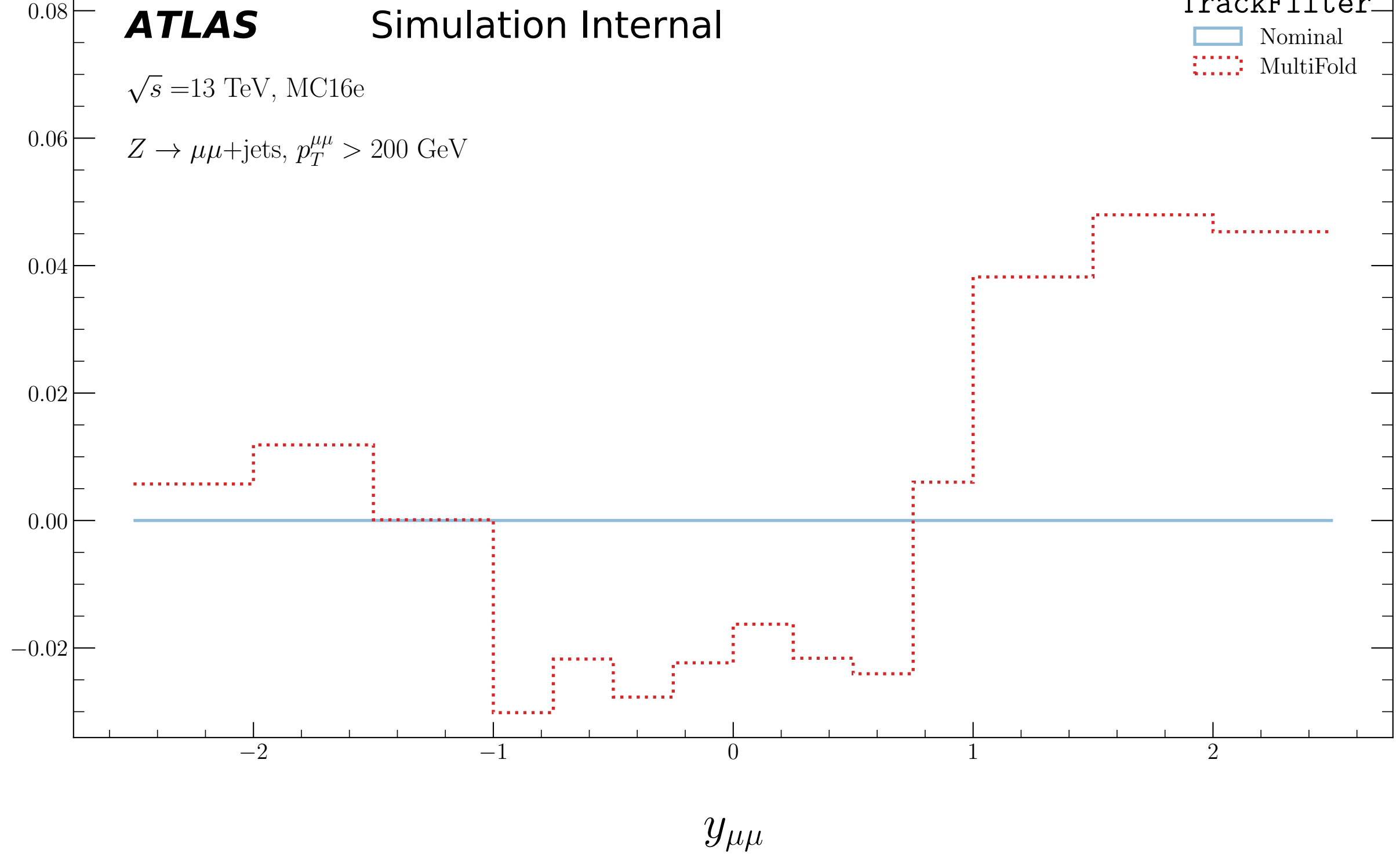
Subleading track jet τ_3











ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeVNominal
MultiFold0.06
0.04
0.02
0.00
-0.02

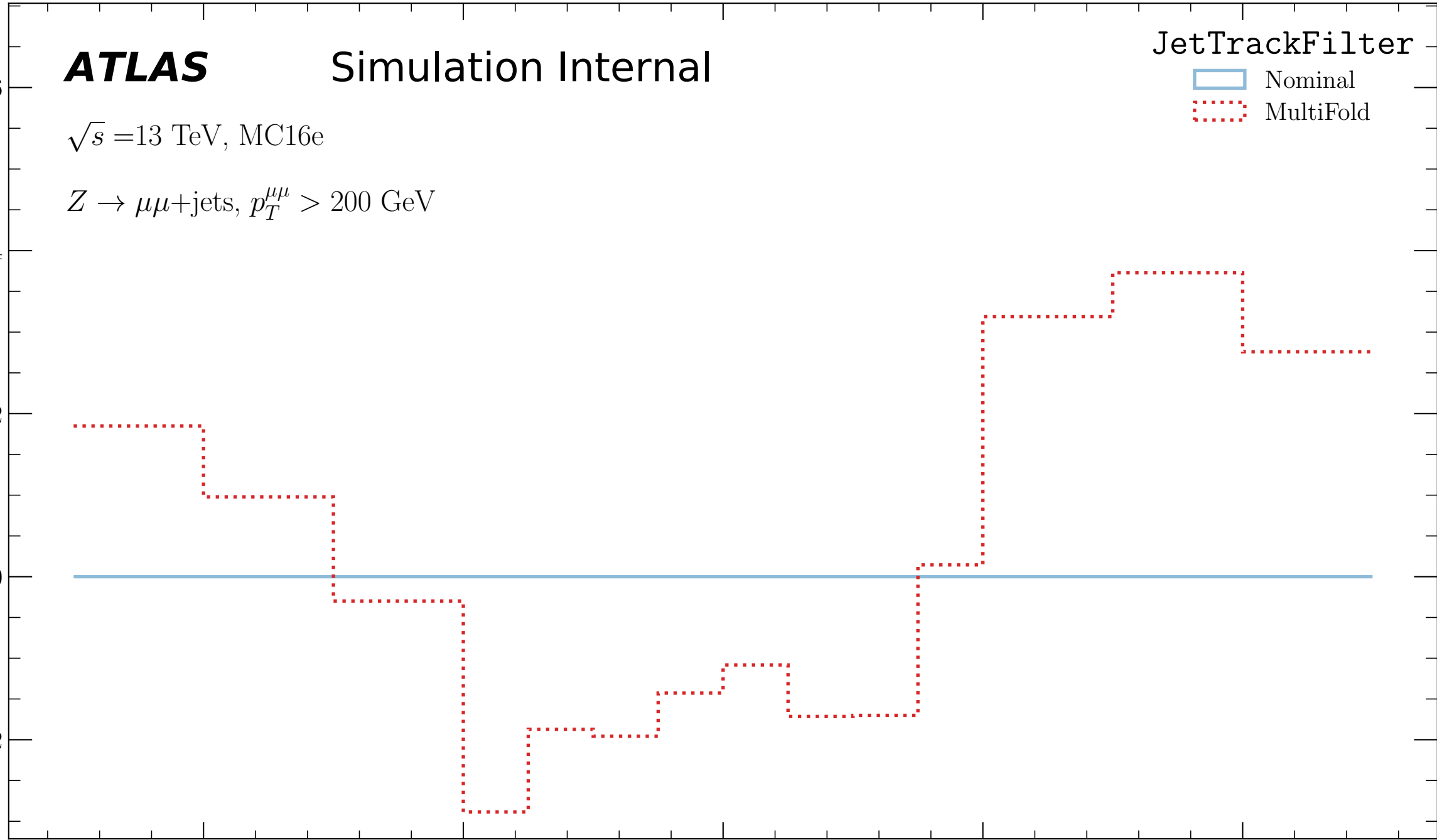
-2

-1

0

1

2

 $y_{\mu\mu}$ 

ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

Nominal

MultiFold

0.06
0.04
0.02
0.00
-0.02

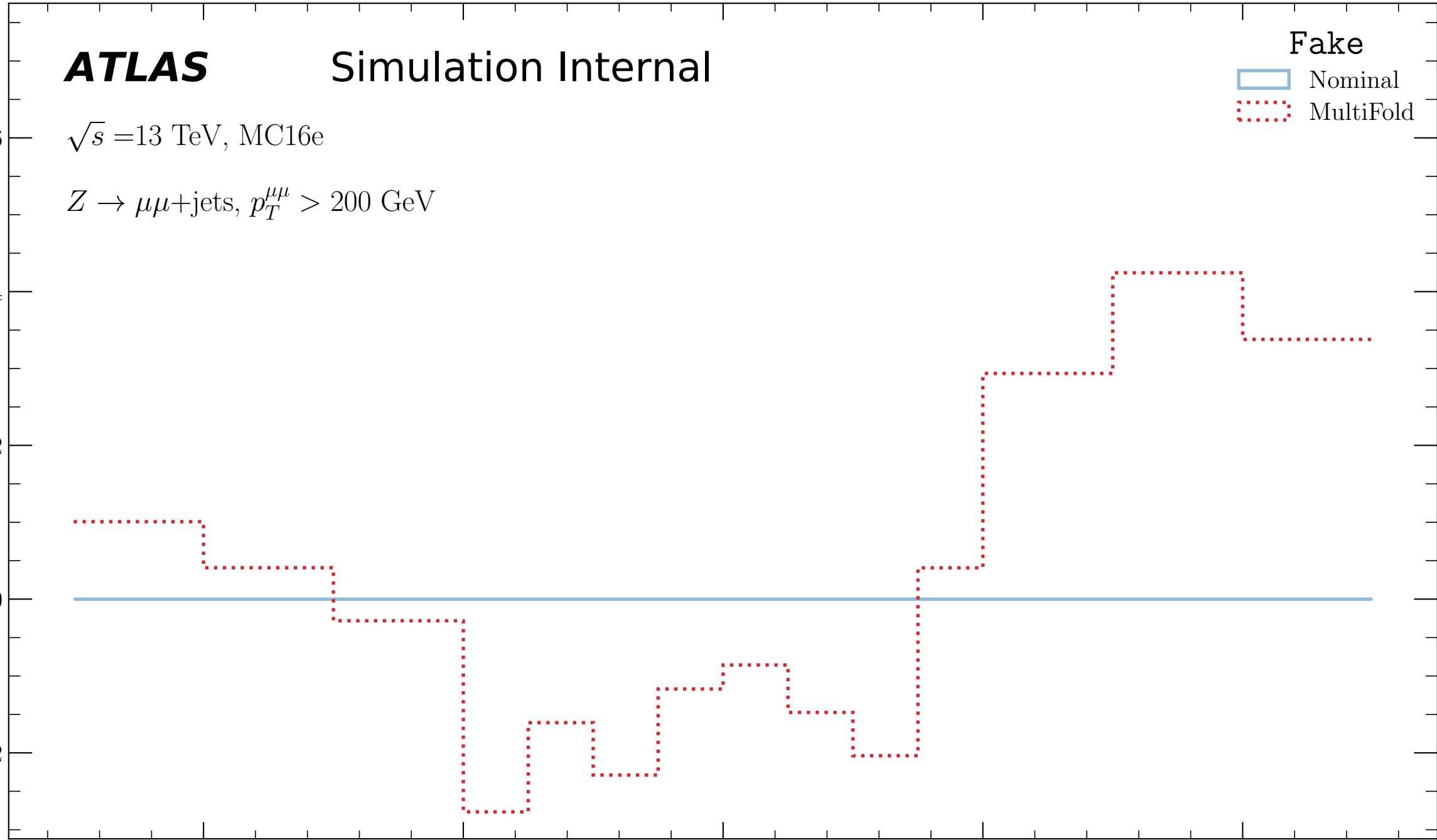
-2

-1

0

1

2

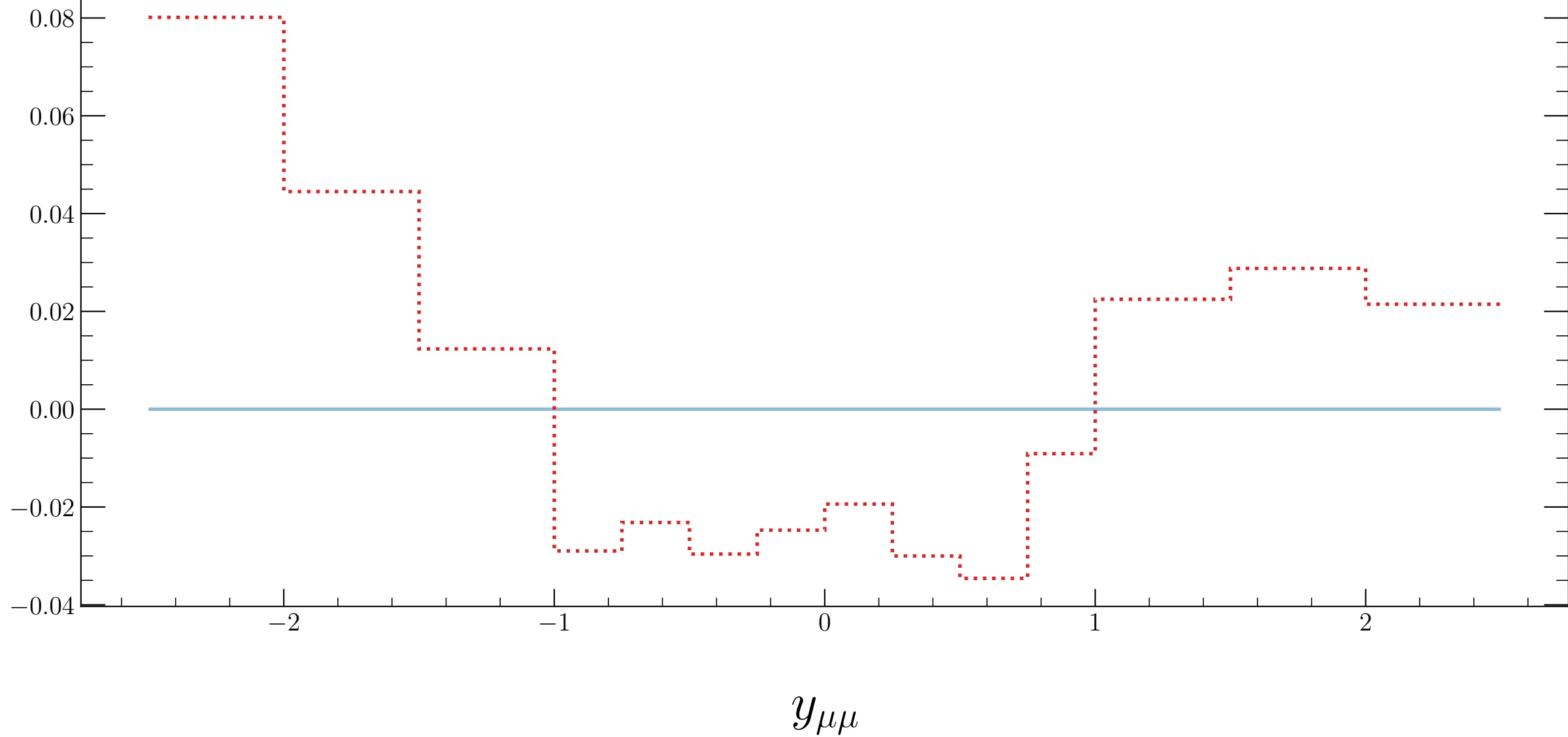
 $y_{\mu\mu}$ 

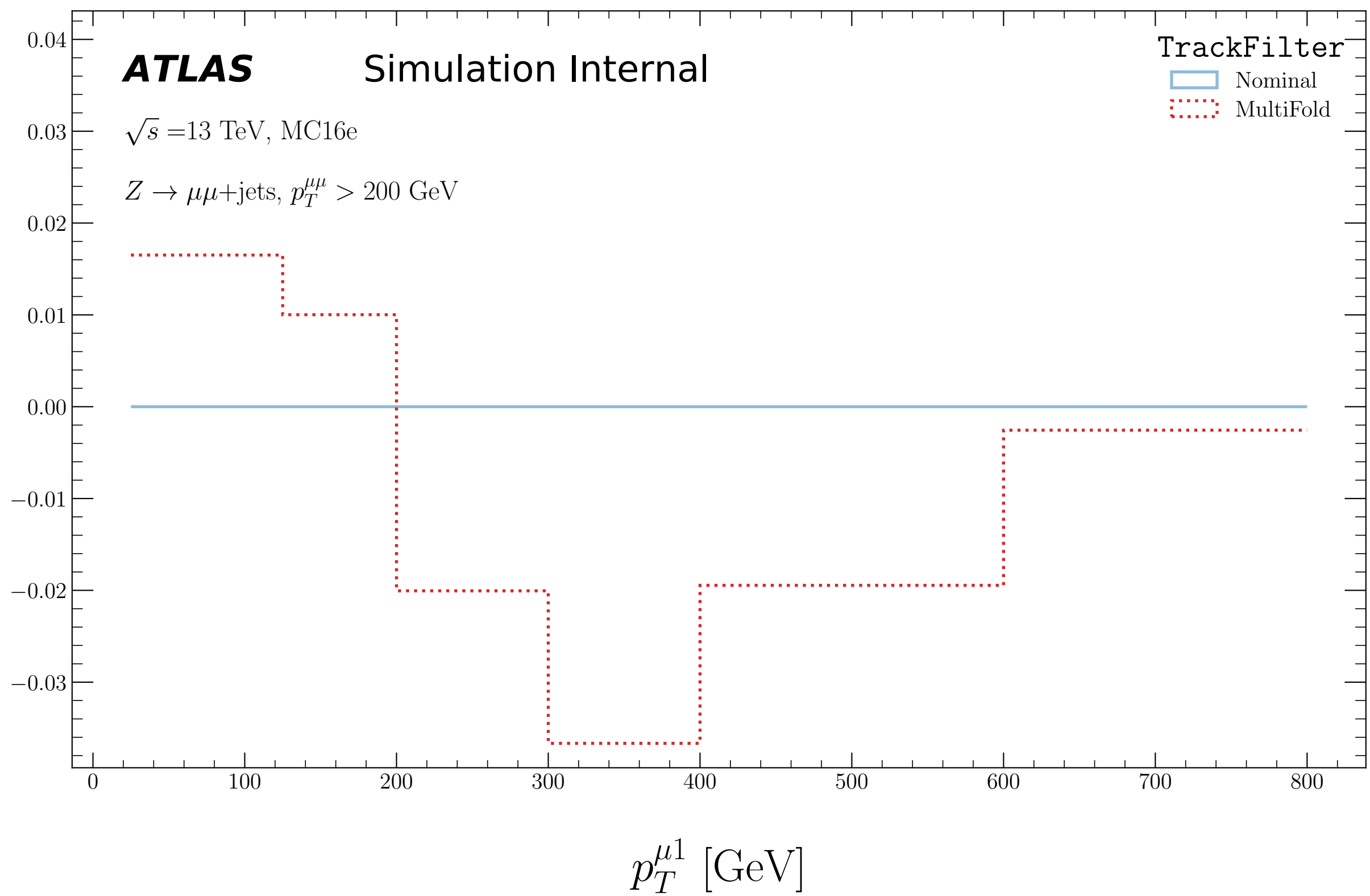
ATLAS

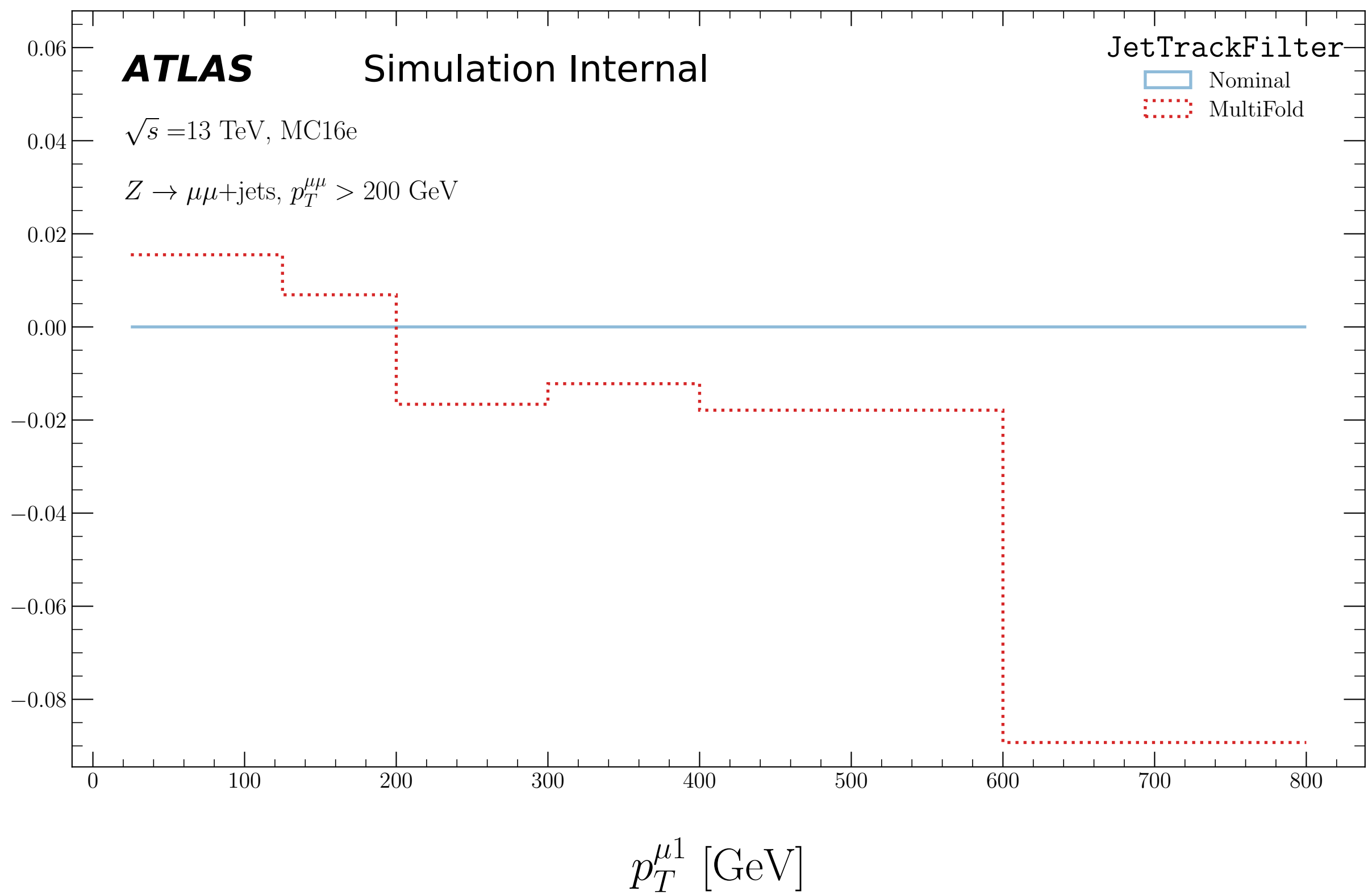
Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

pTScale

Nominal
MultiFold





ATLAS

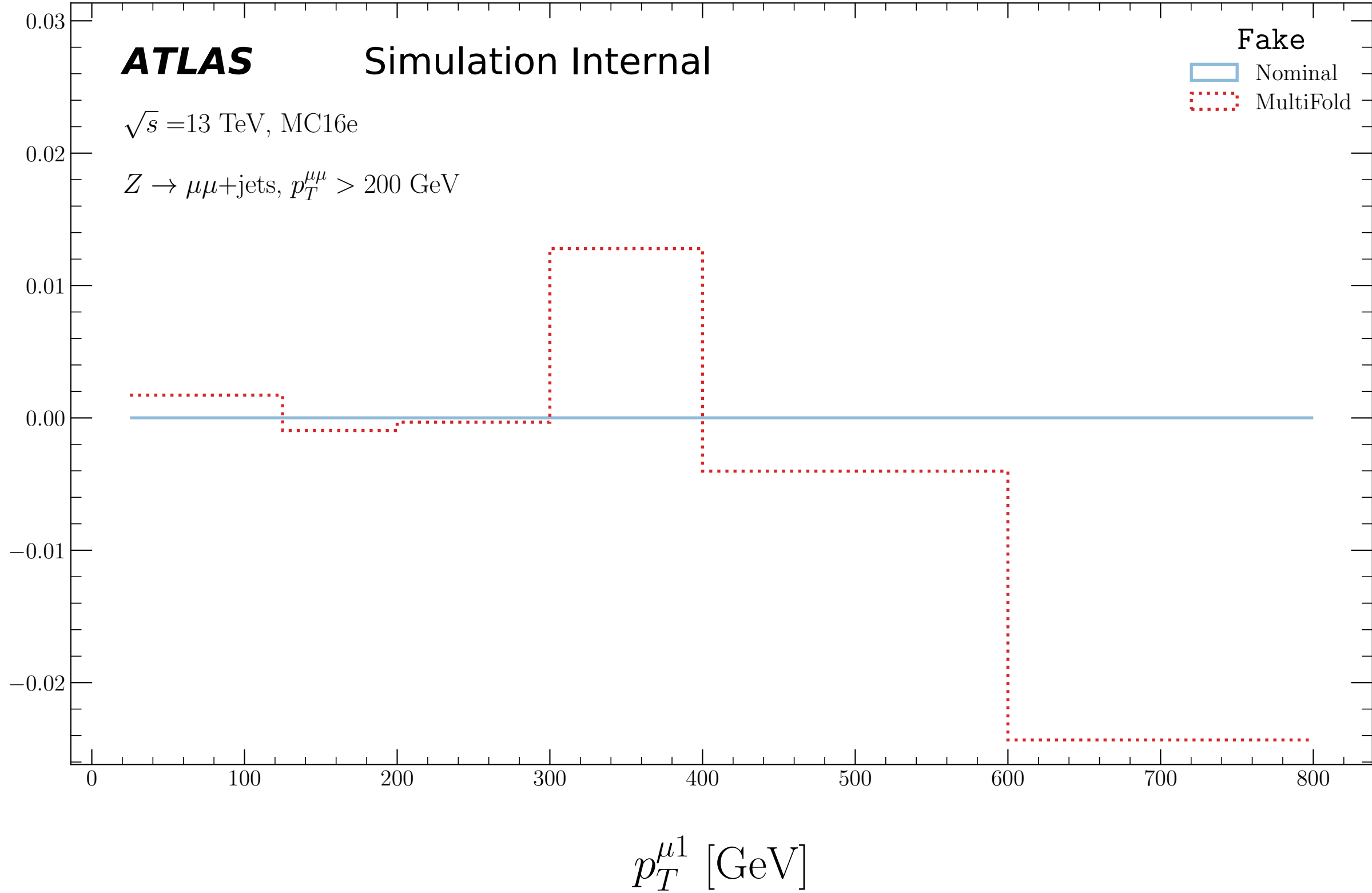
Simulation Internal

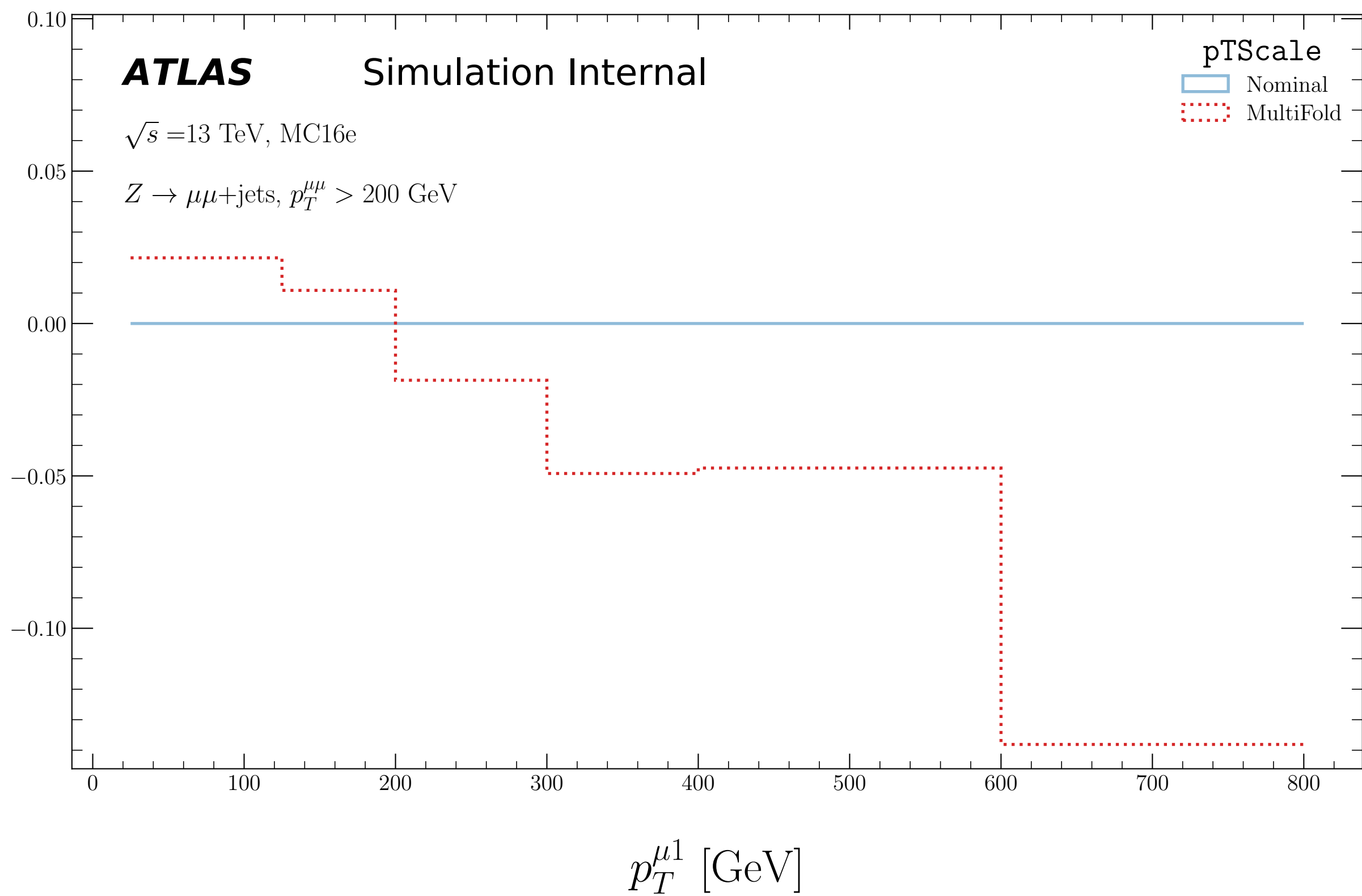
 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

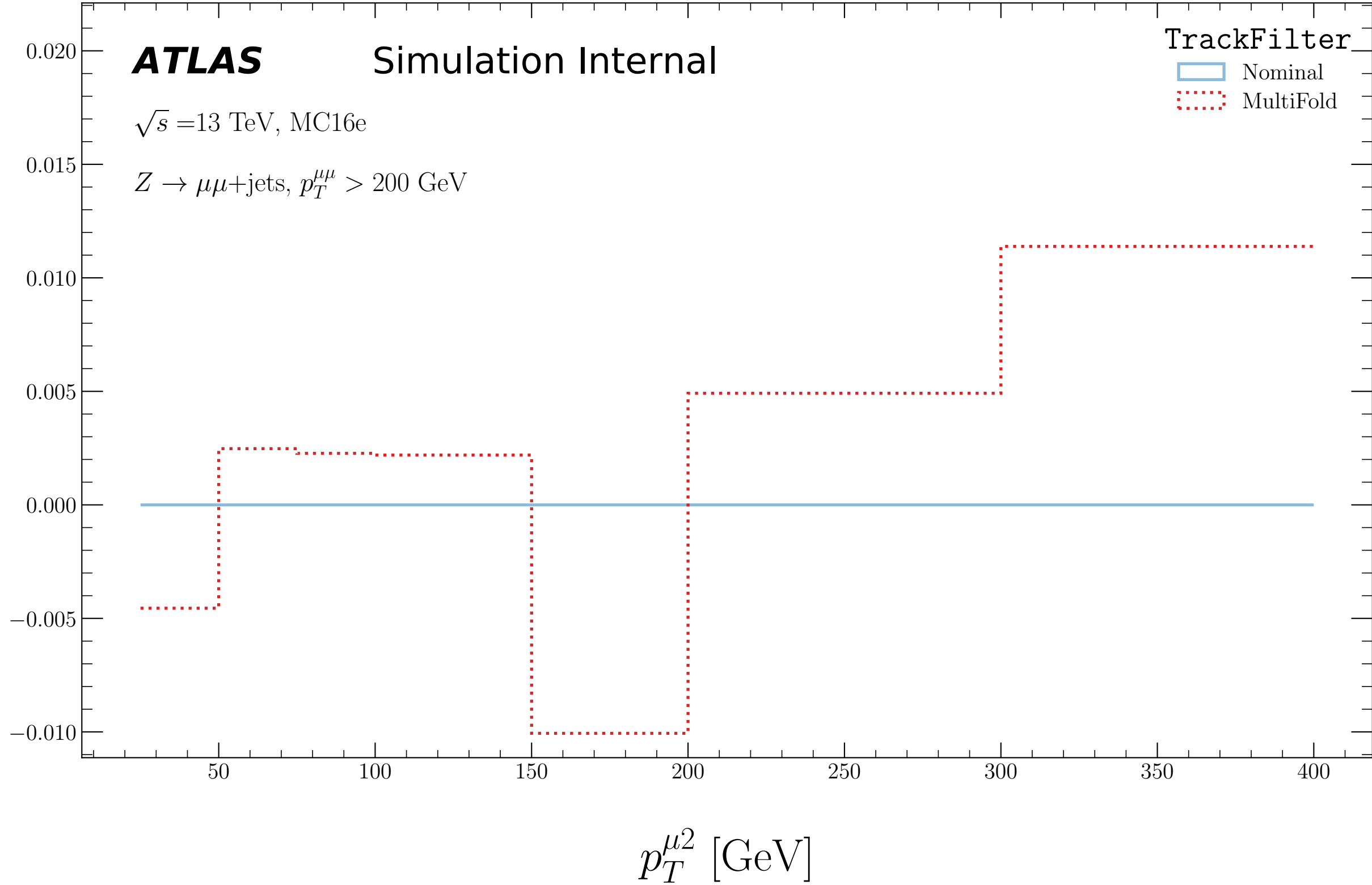
Fake

Nominal

MultiFold



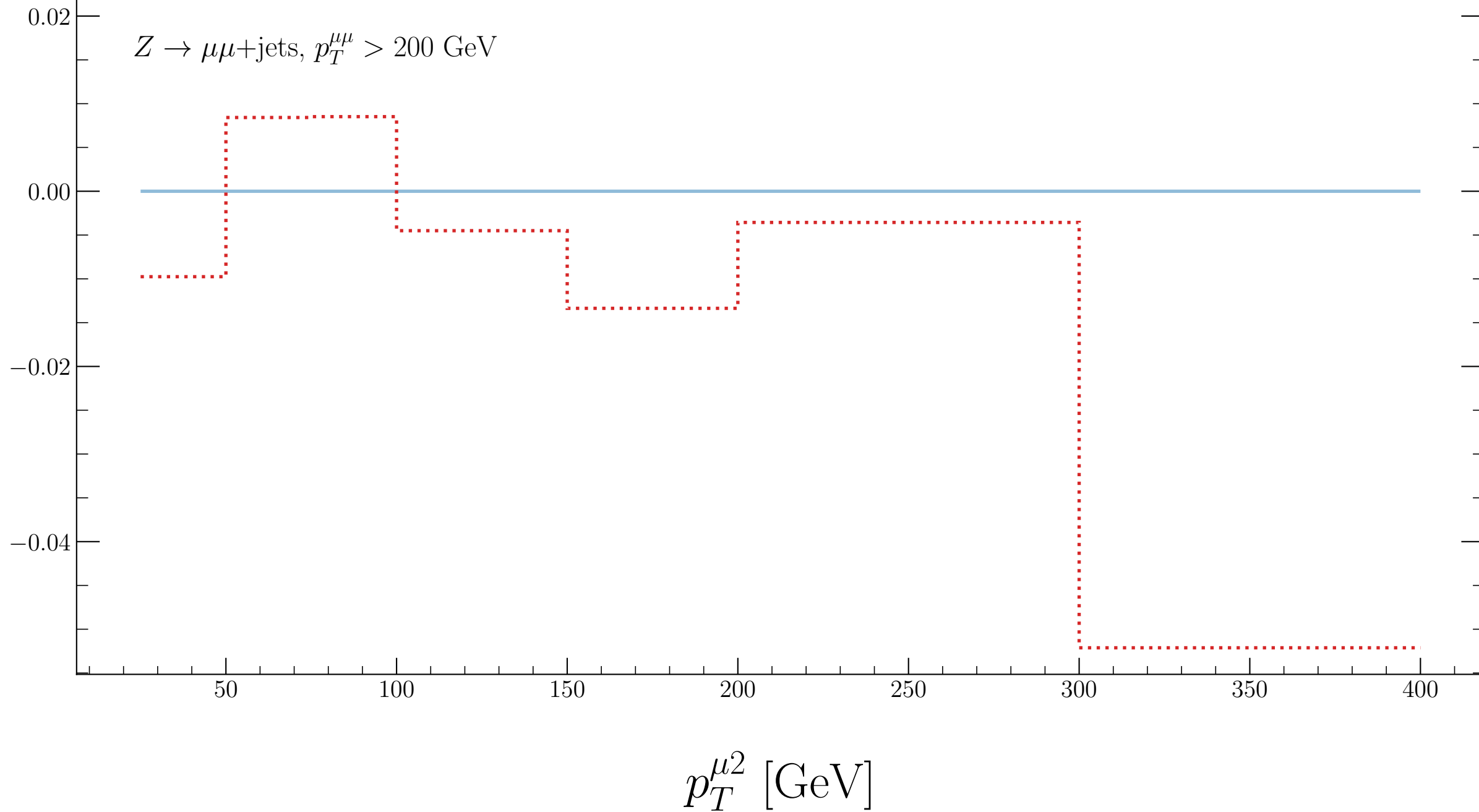




ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeVNominal
MultiFold

ATLAS

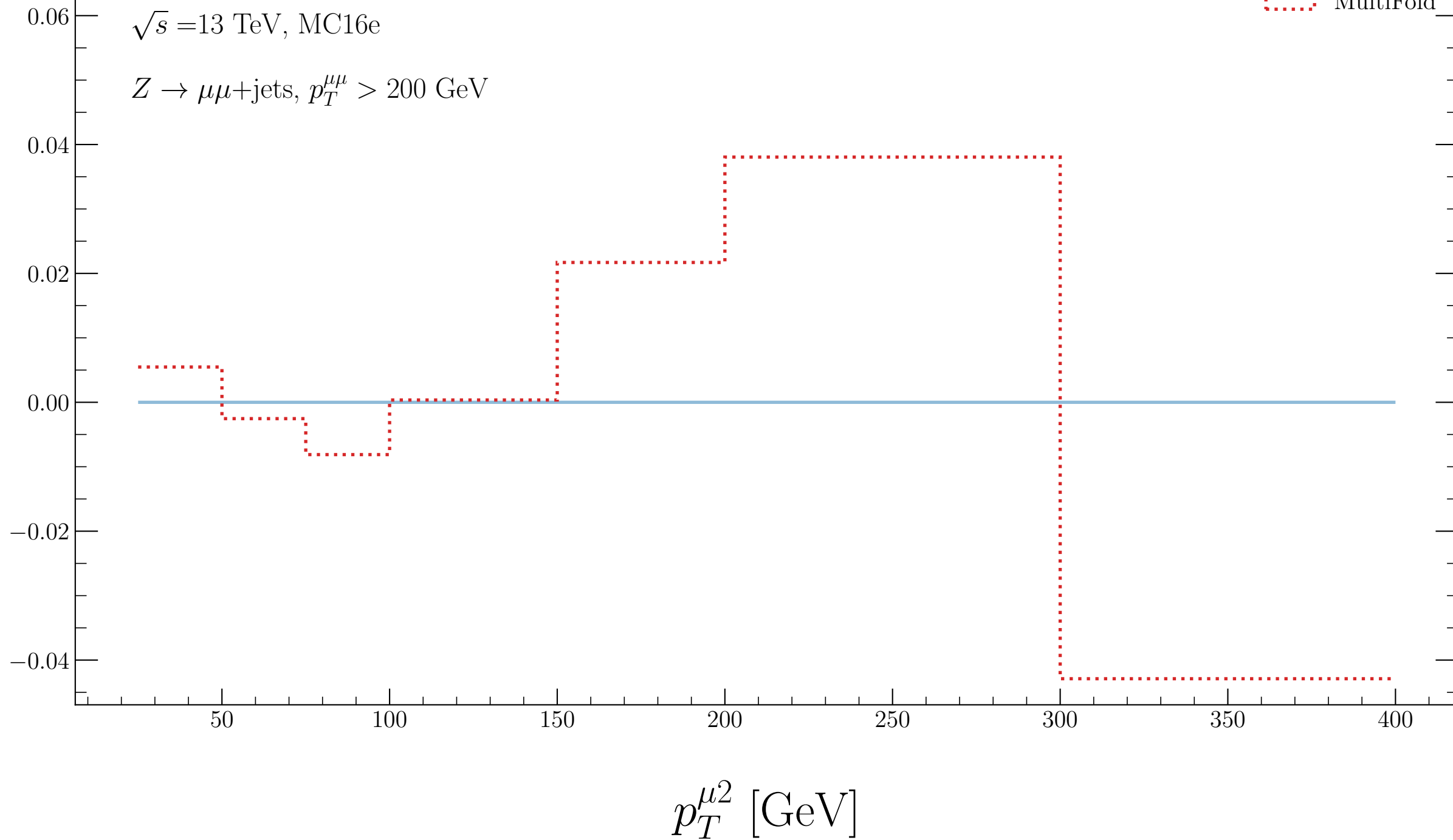
Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

Nominal

MultiFold

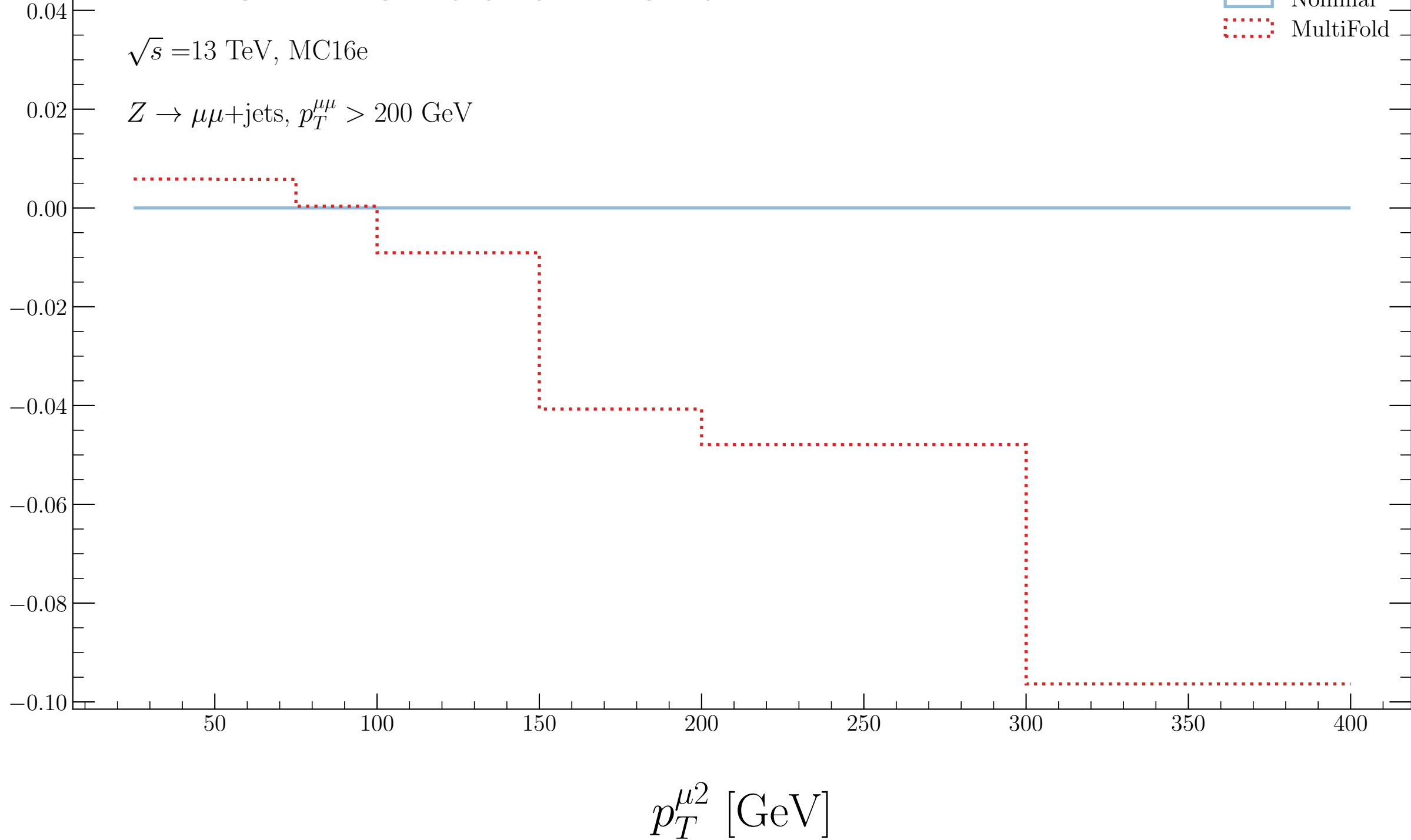


ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

pTScale

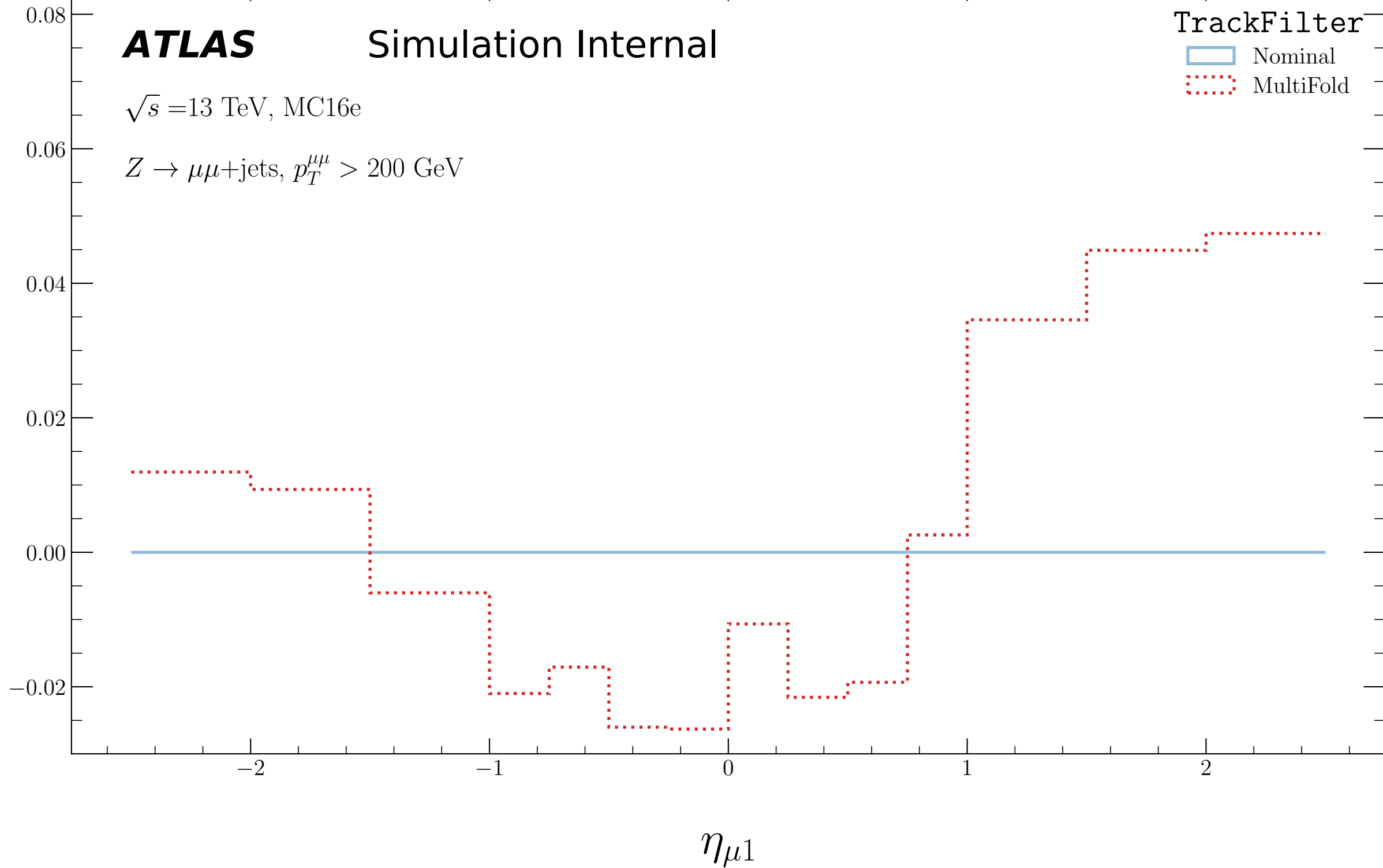
Nominal
MultiFold

ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

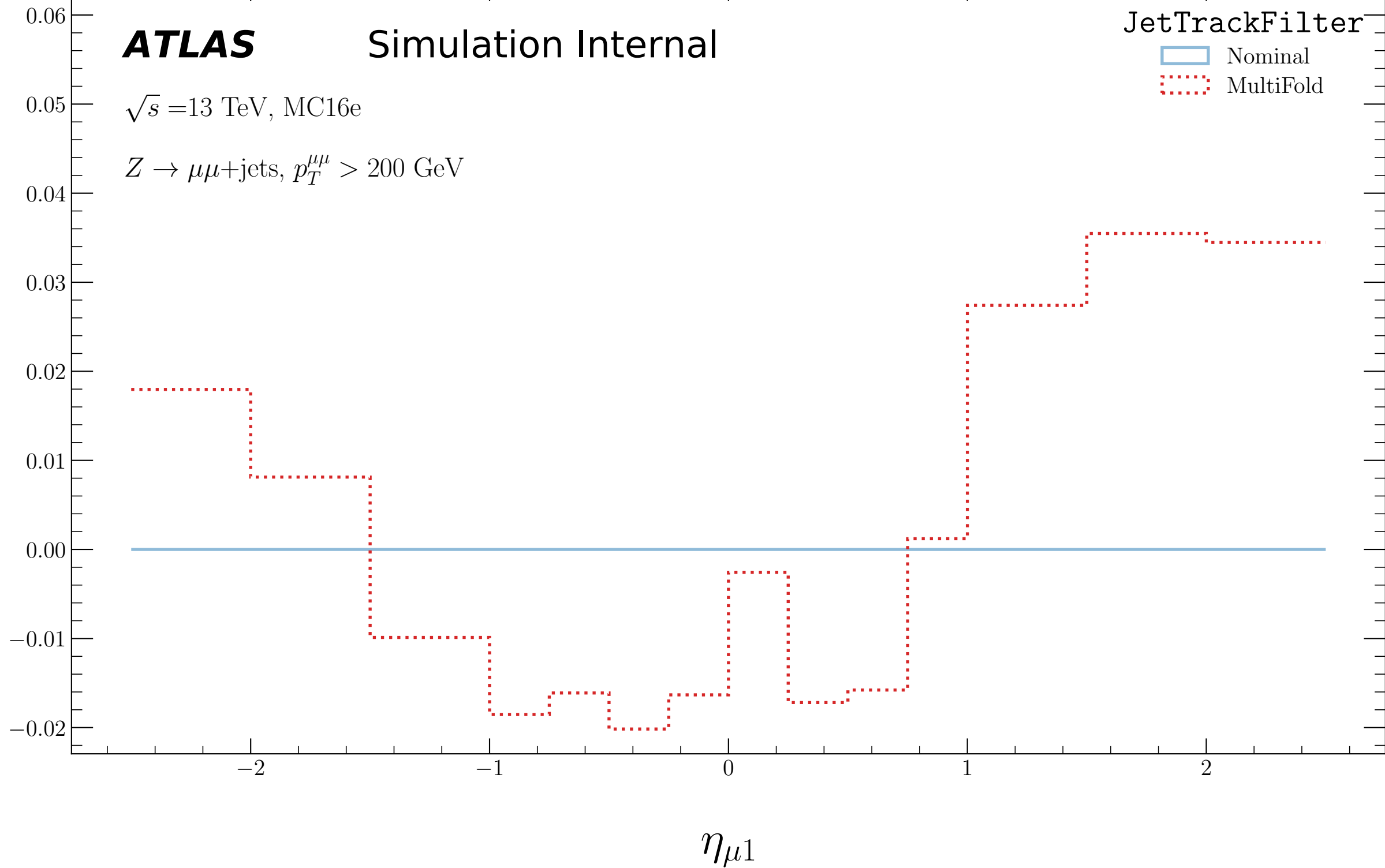
TrackFilter

Nominal
MultiFold

ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeVNominal
MultiFold

ATLAS

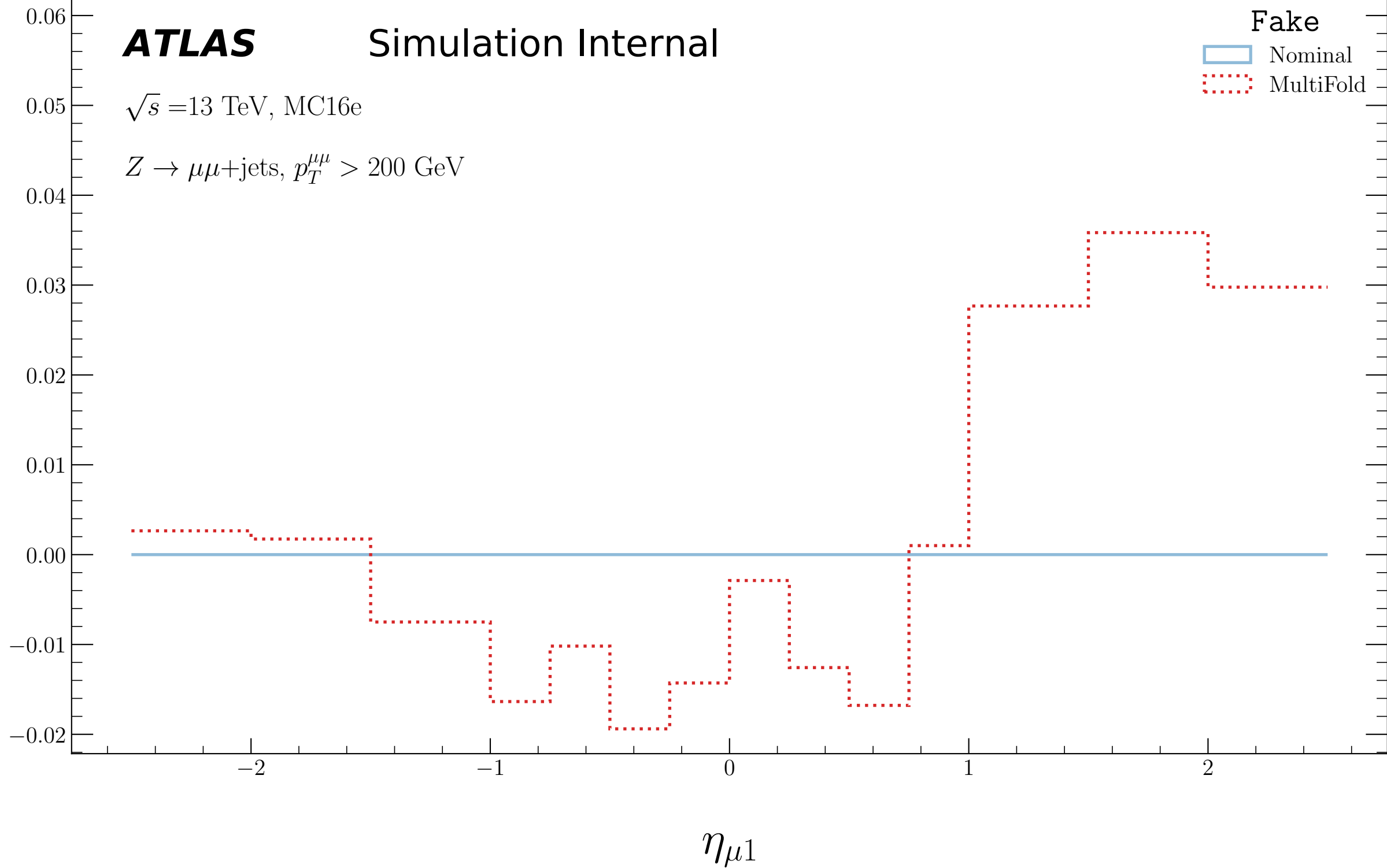
Simulation Internal

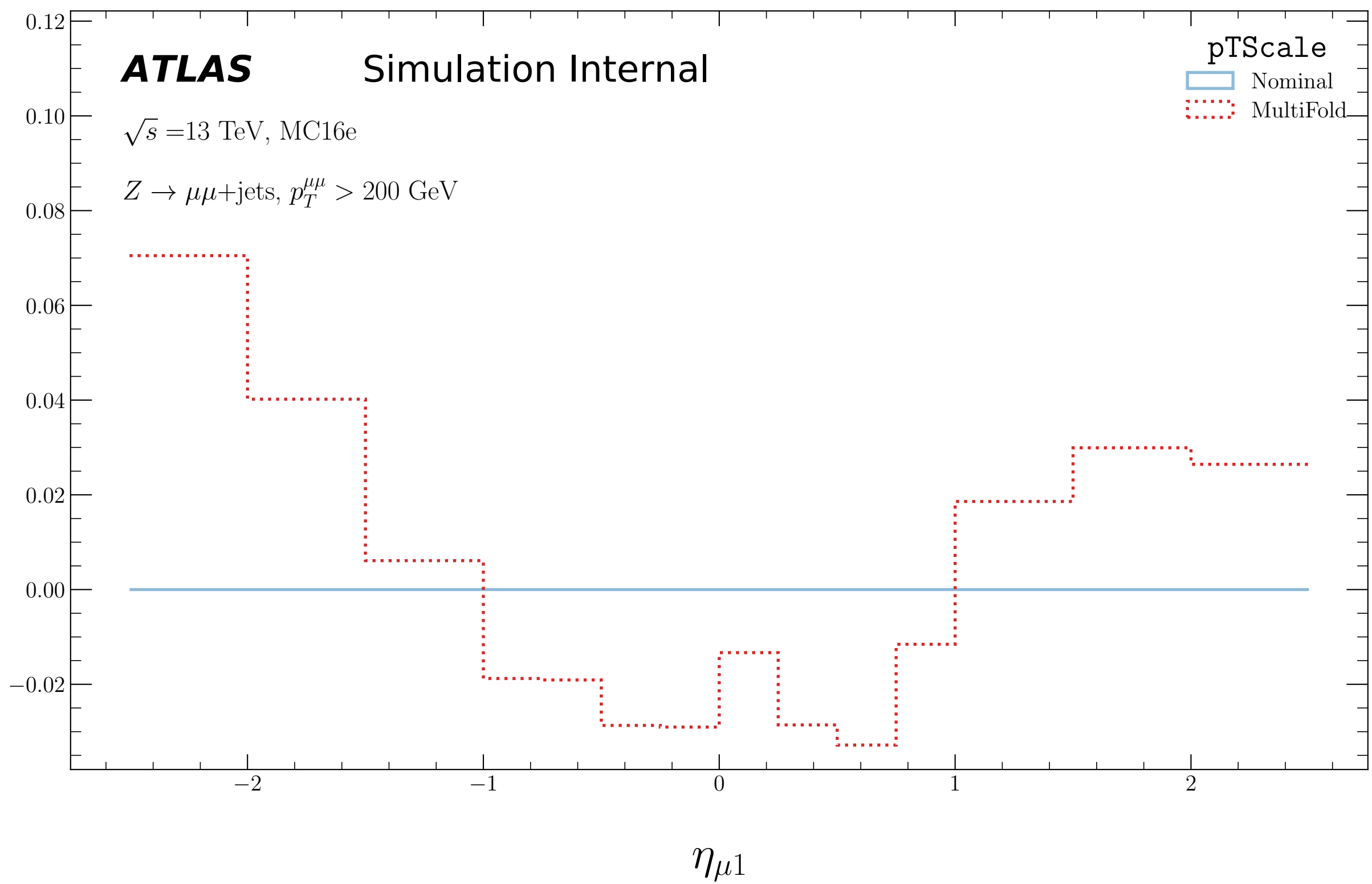
 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

Nominal

MultiFold





ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

TrackFilter

Nominal
MultiFold0.08
0.06
0.04
0.02
0.00
-0.02

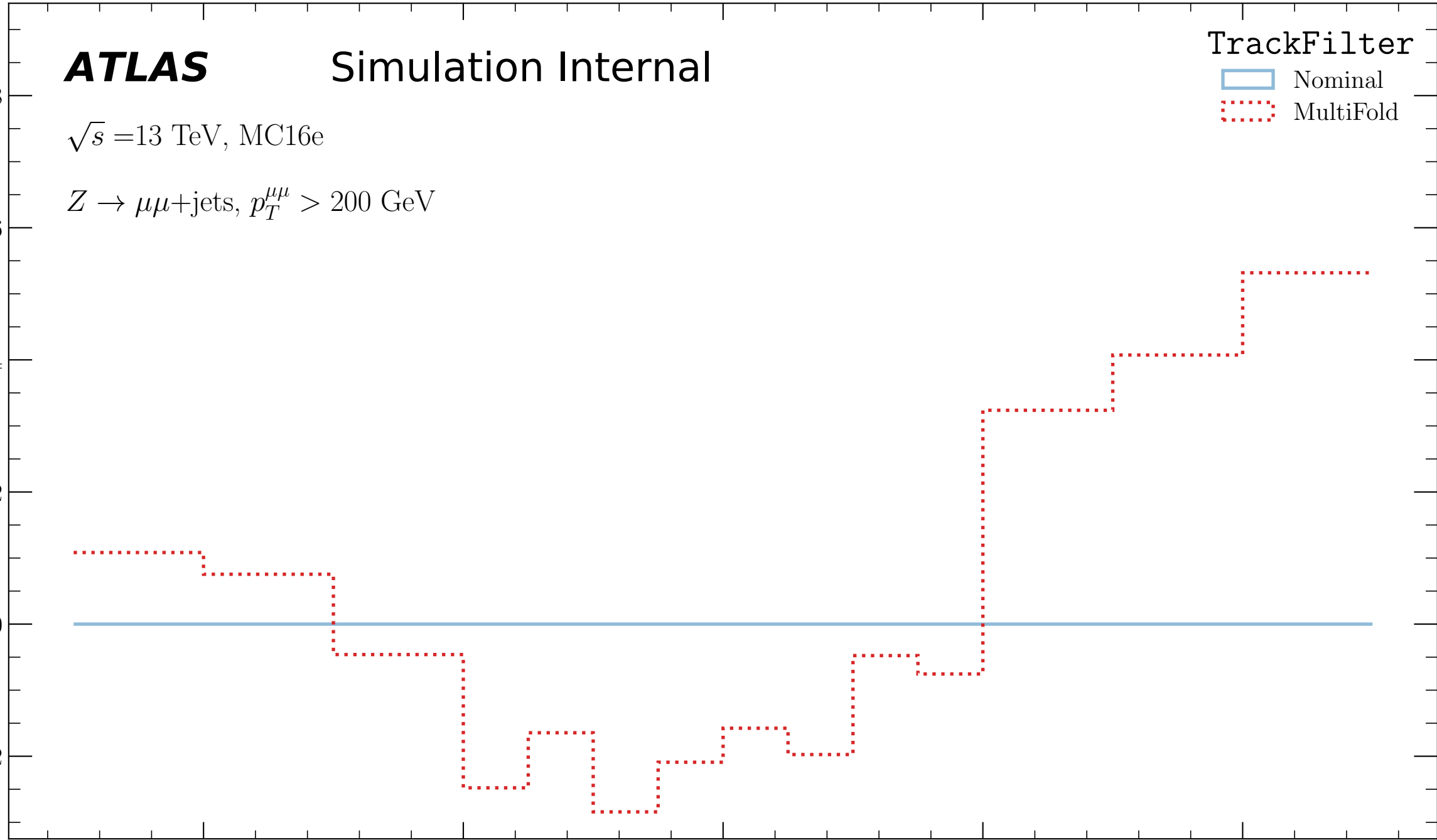
-2

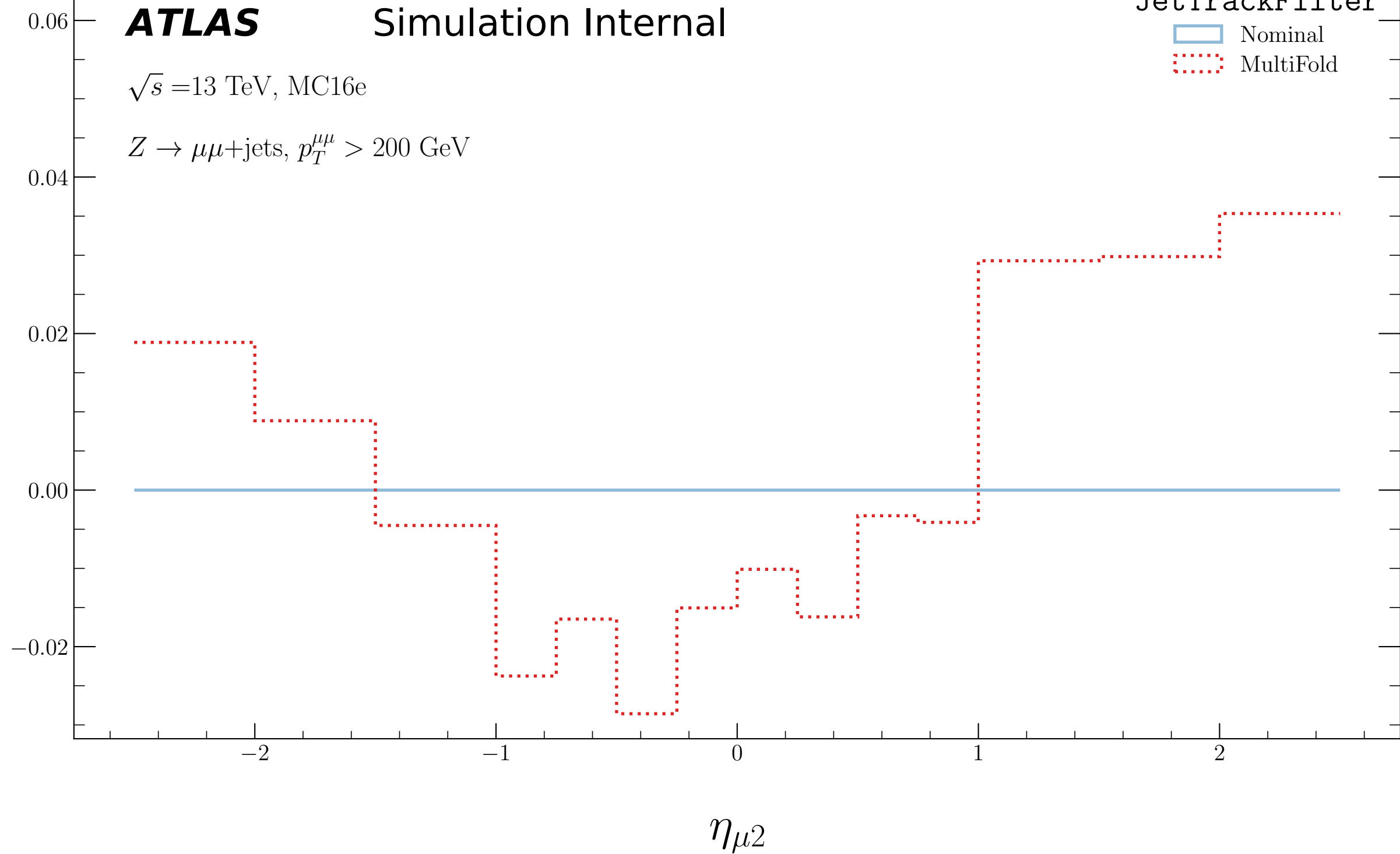
-1

0

1

2

 $\eta_{\mu 2}$ 



ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake


Nominal
MultiFold0.08
0.06
0.04
0.02
0.00
-0.02

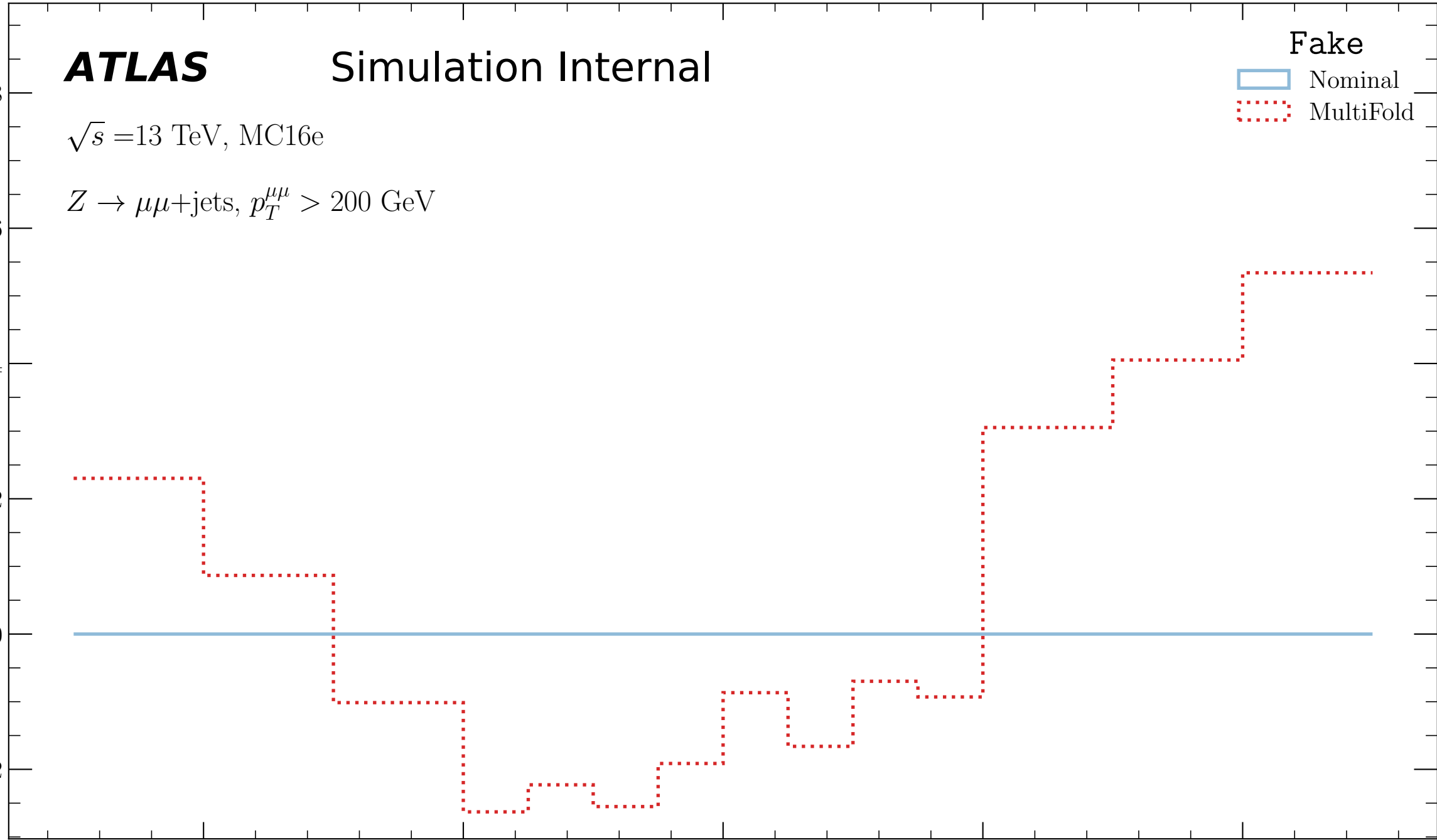
-2

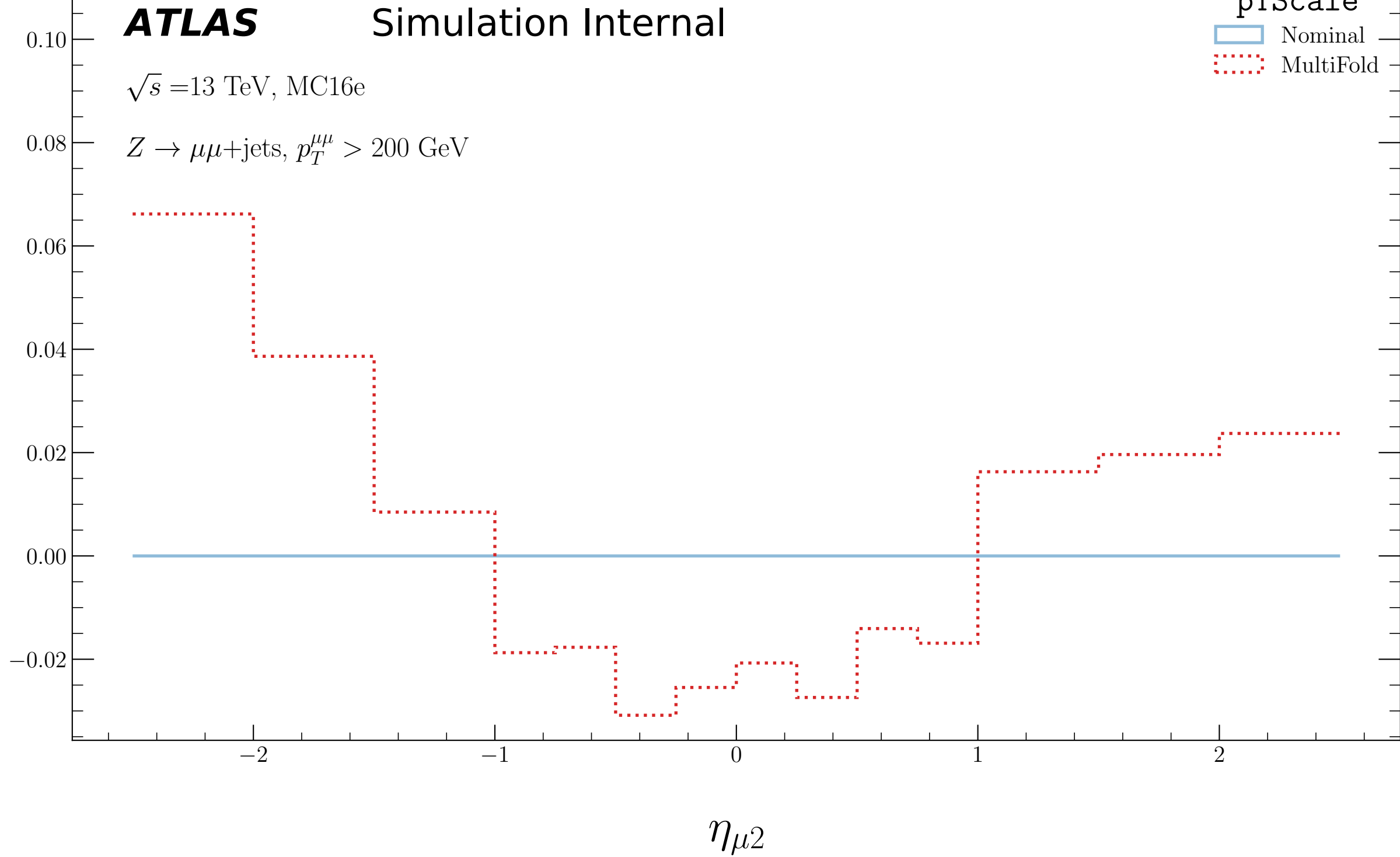
-1

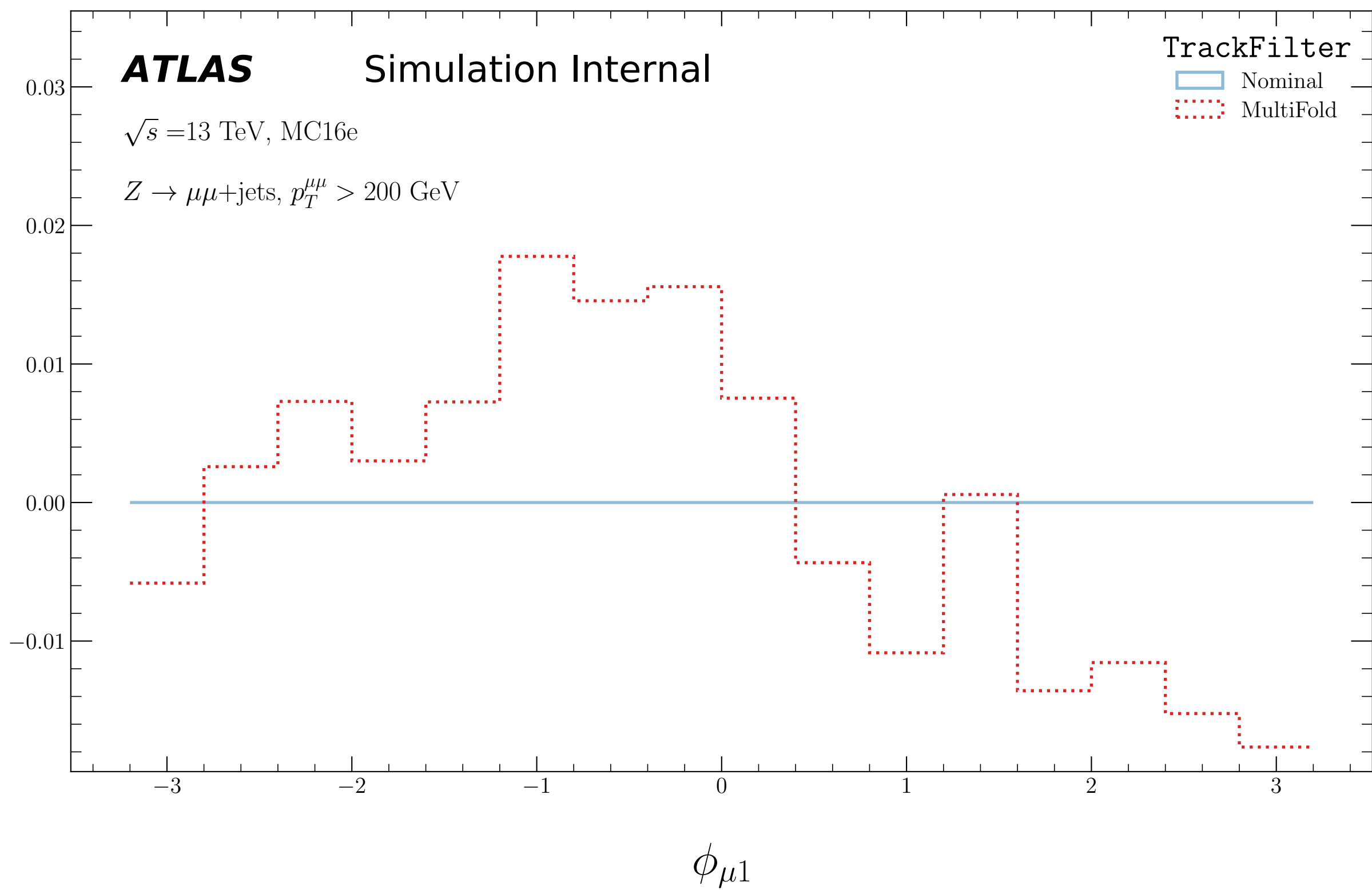
0

1

2

 $\eta_{\mu 2}$ 

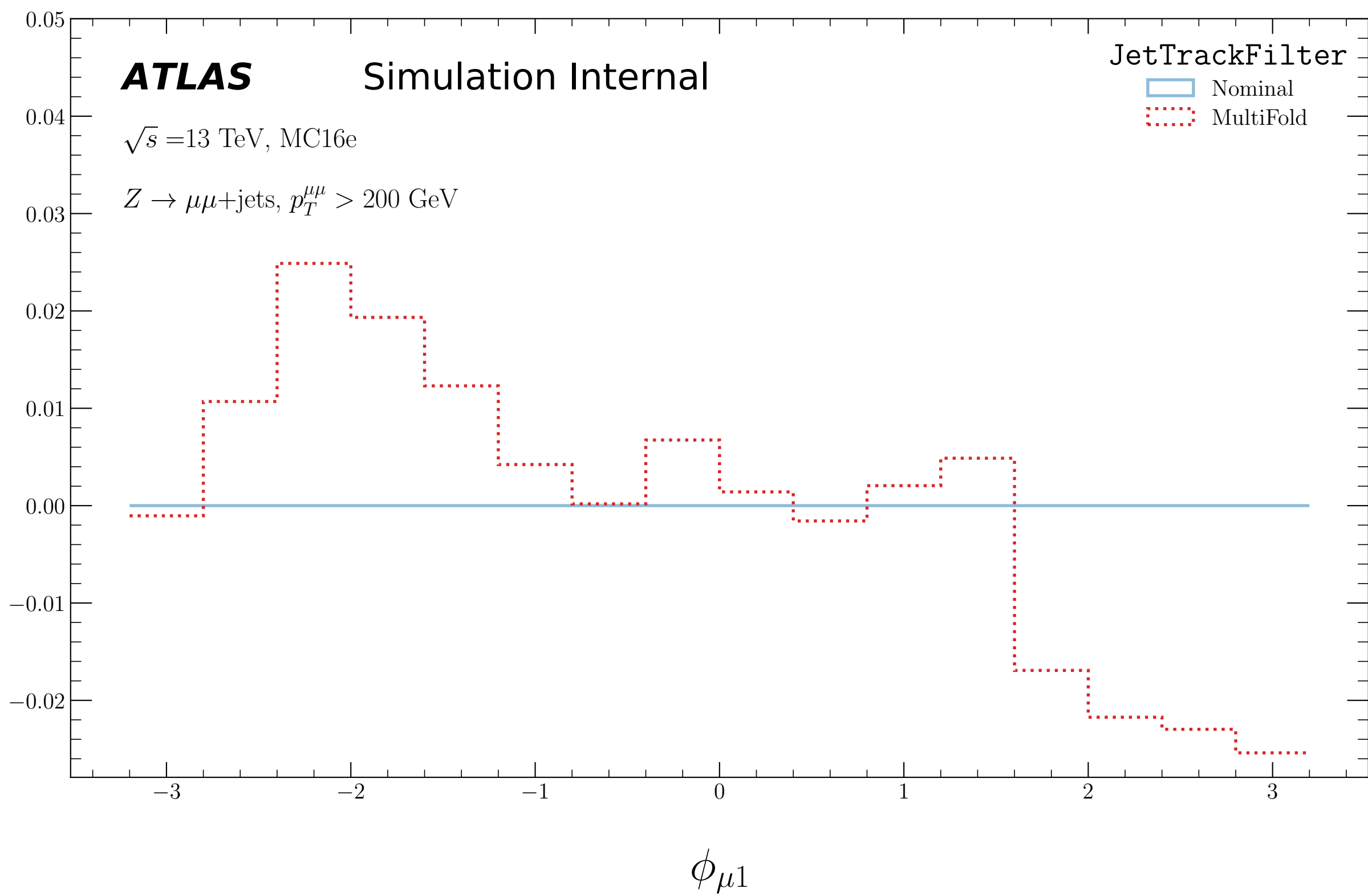




ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeVNominal
MultiFold

ATLAS

Simulation Internal

 $\sqrt{s}=13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

Nominal

MultiFold

0.015
0.010
0.005
0.000
-0.005
-0.010

-3

-2

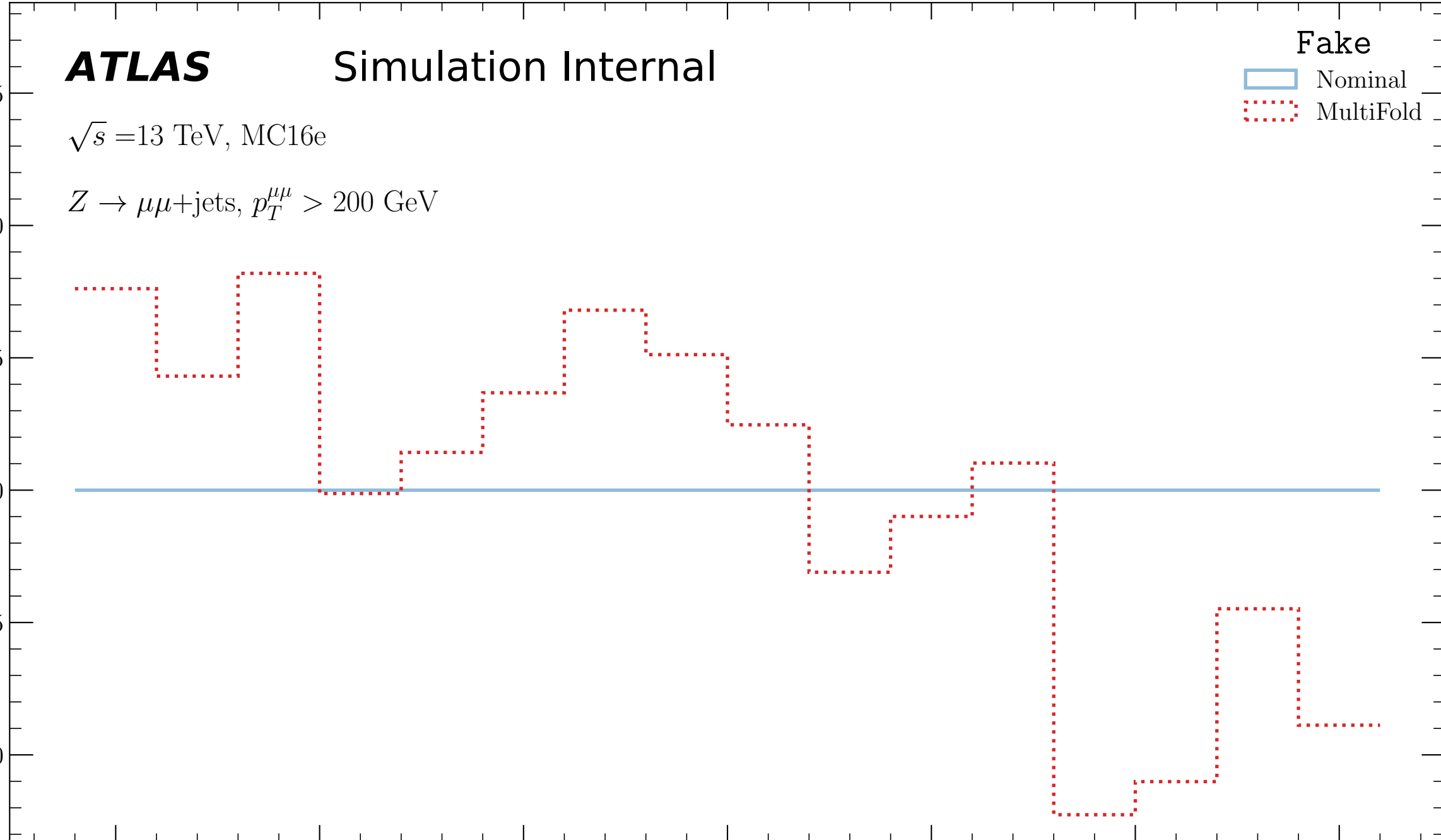
-1

0

1

2

3

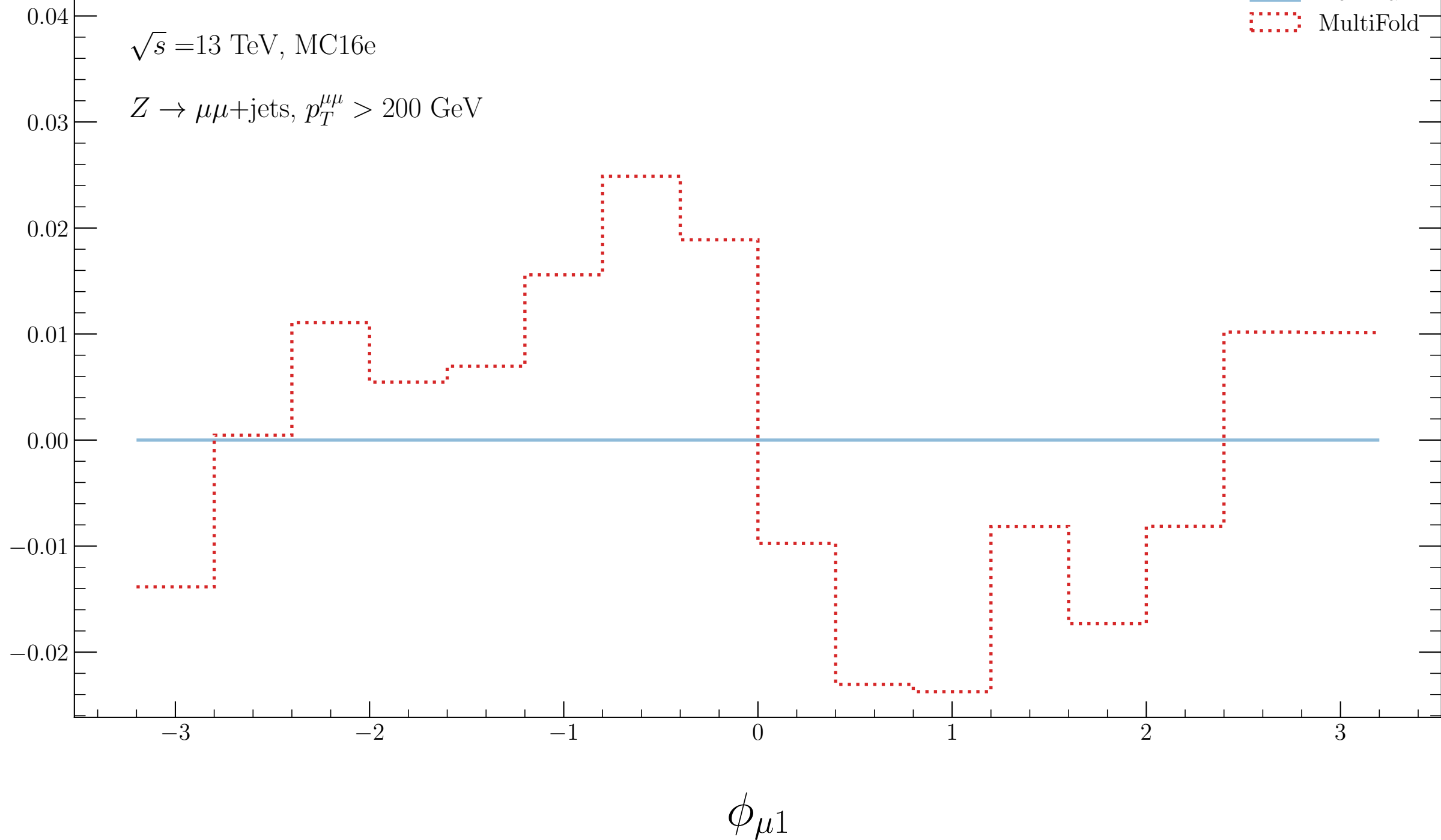
 $\phi_{\mu 1}$ 

ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

pTScale

Nominal
MultiFold

ATLAS

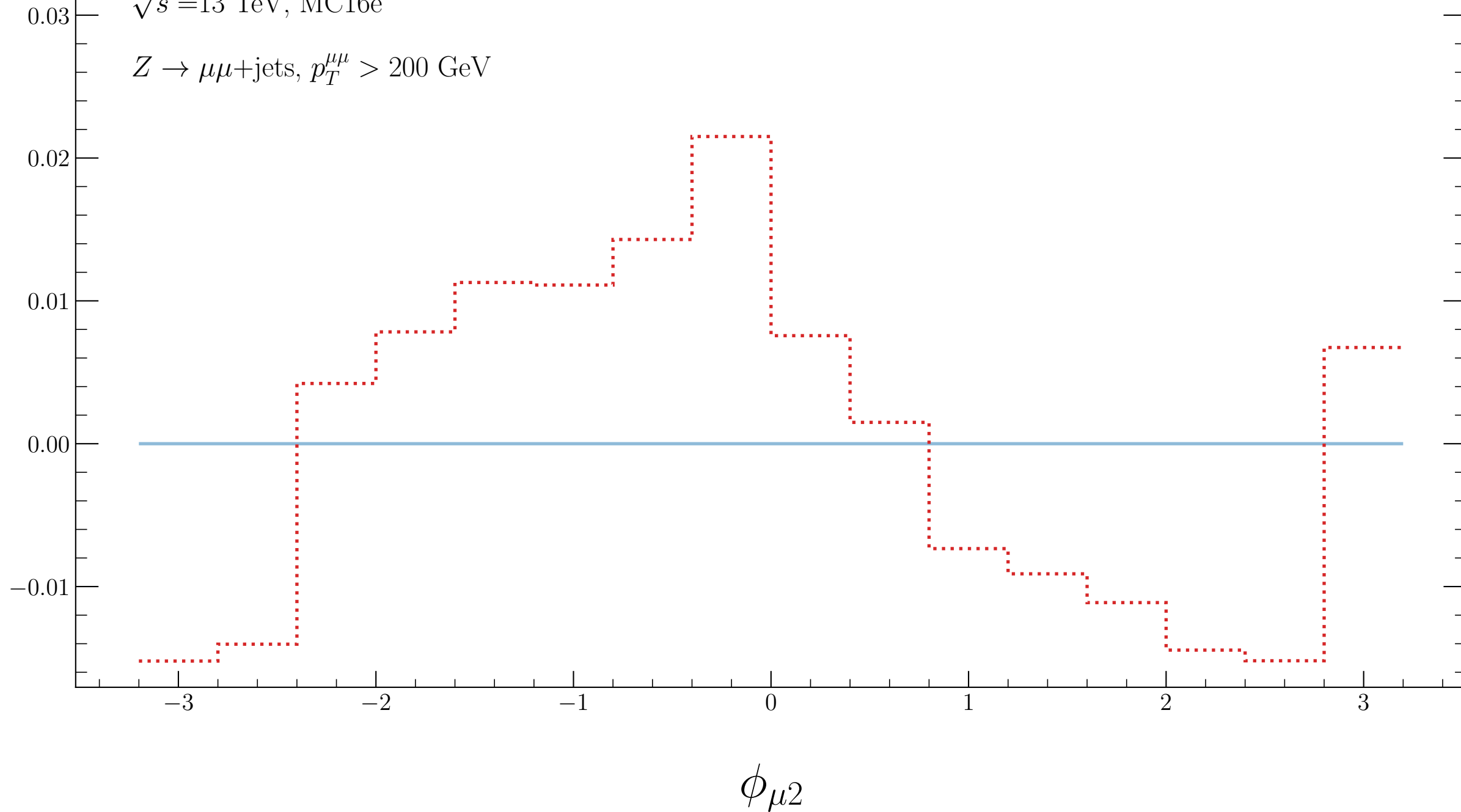
Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

TrackFilter

Nominal

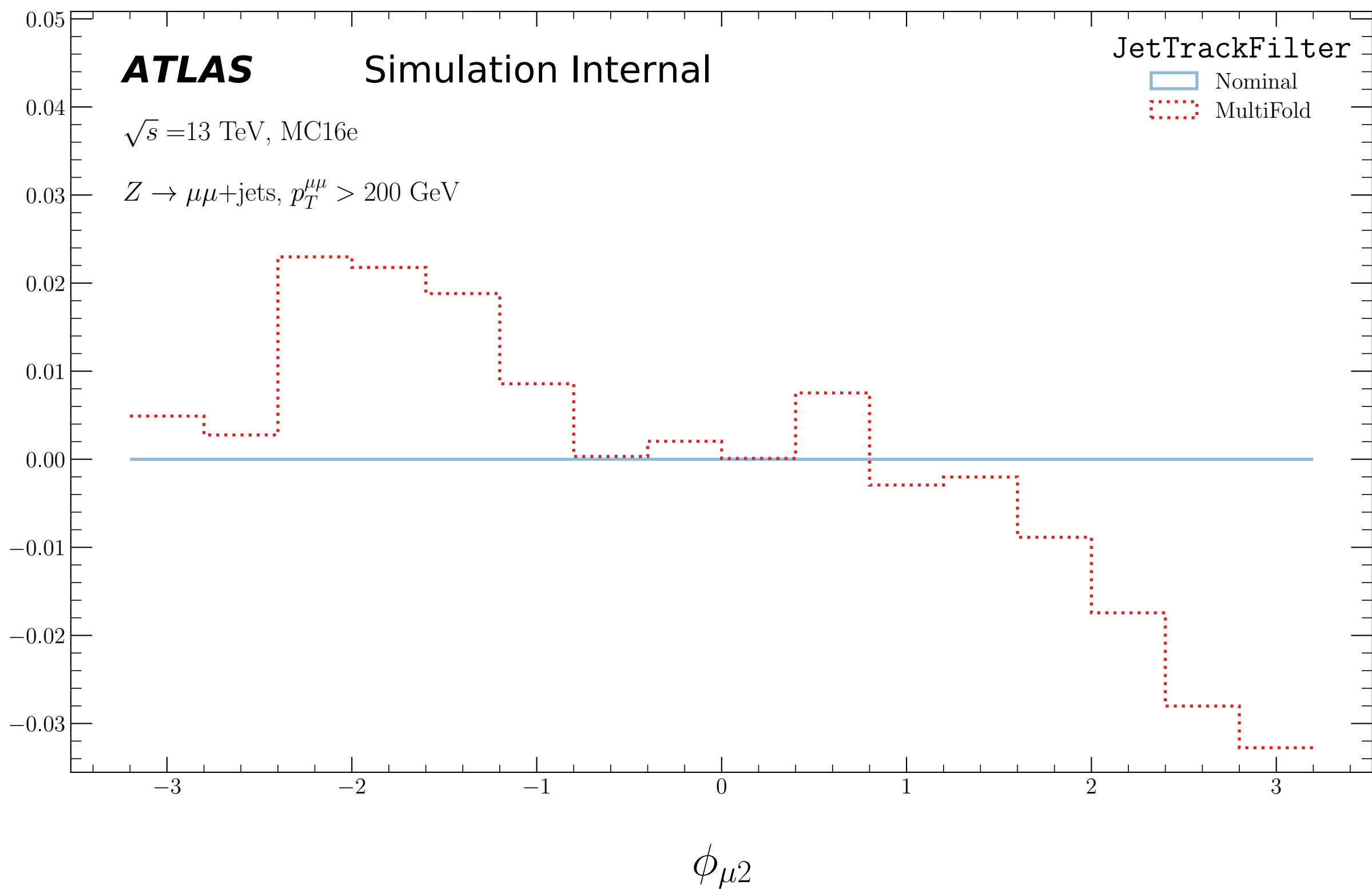
MultiFold



ATLAS

Simulation Internal

JetTrackFilter

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeVNominal
MultiFold

ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

Fake

Nominal
MultiFold0.05
0.04
0.03
0.02
0.01
0.00
-0.01

-3

-2

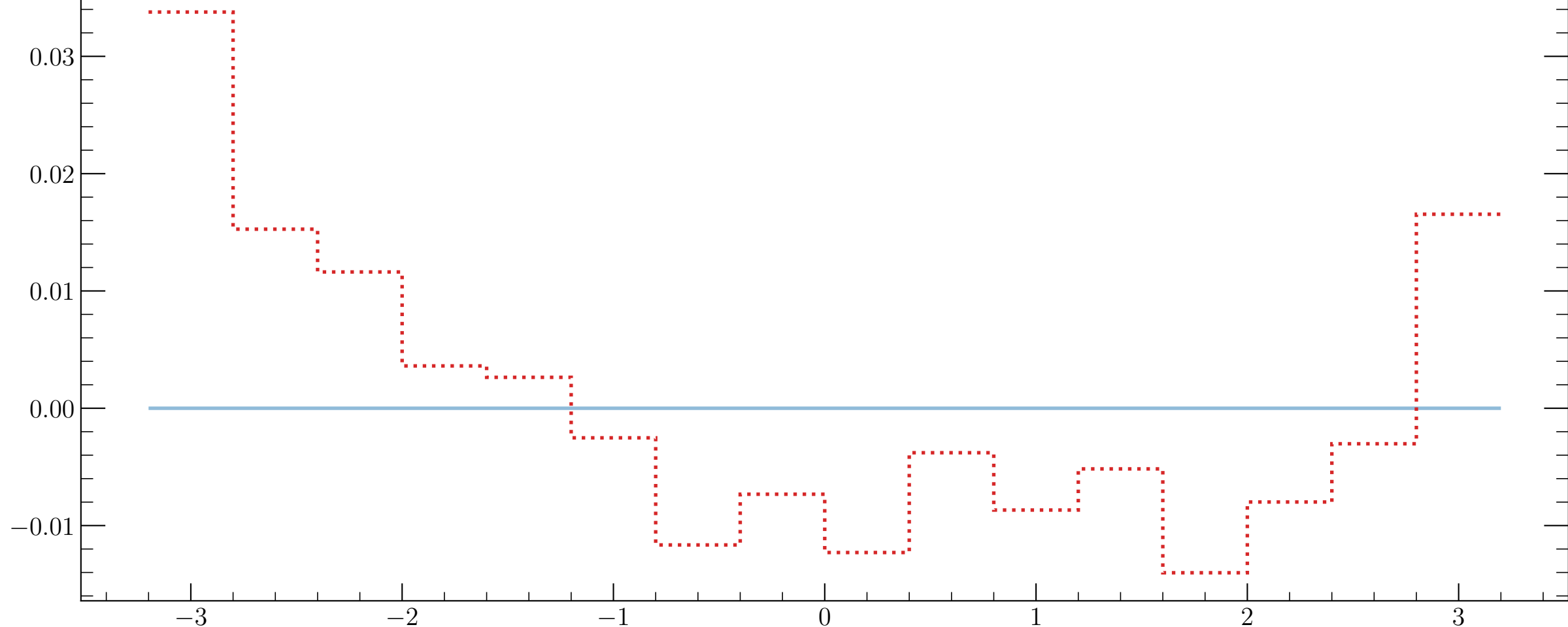
-1

0

1

2

3

 $\phi_{\mu 2}$ 

ATLAS

Simulation Internal

 $\sqrt{s} = 13$ TeV, MC16e $Z \rightarrow \mu\mu + \text{jets}, p_T^{\mu\mu} > 200$ GeV

pTScale

Nominal
MultiFold