

Events / 0.25

**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$

$t_l \tau_{\text{had}}^{-1} j$

Other MC

b-jets fake  $\tau$

$\tau_W$

QCD Fake lep

$\bar{t}t \rightarrow bWcH \times 10$

$t\bar{t}$

lepton fake  $\tau$

Other Fake  $\tau$

data

30

25

20

15

10

5

0

Data/Bkg

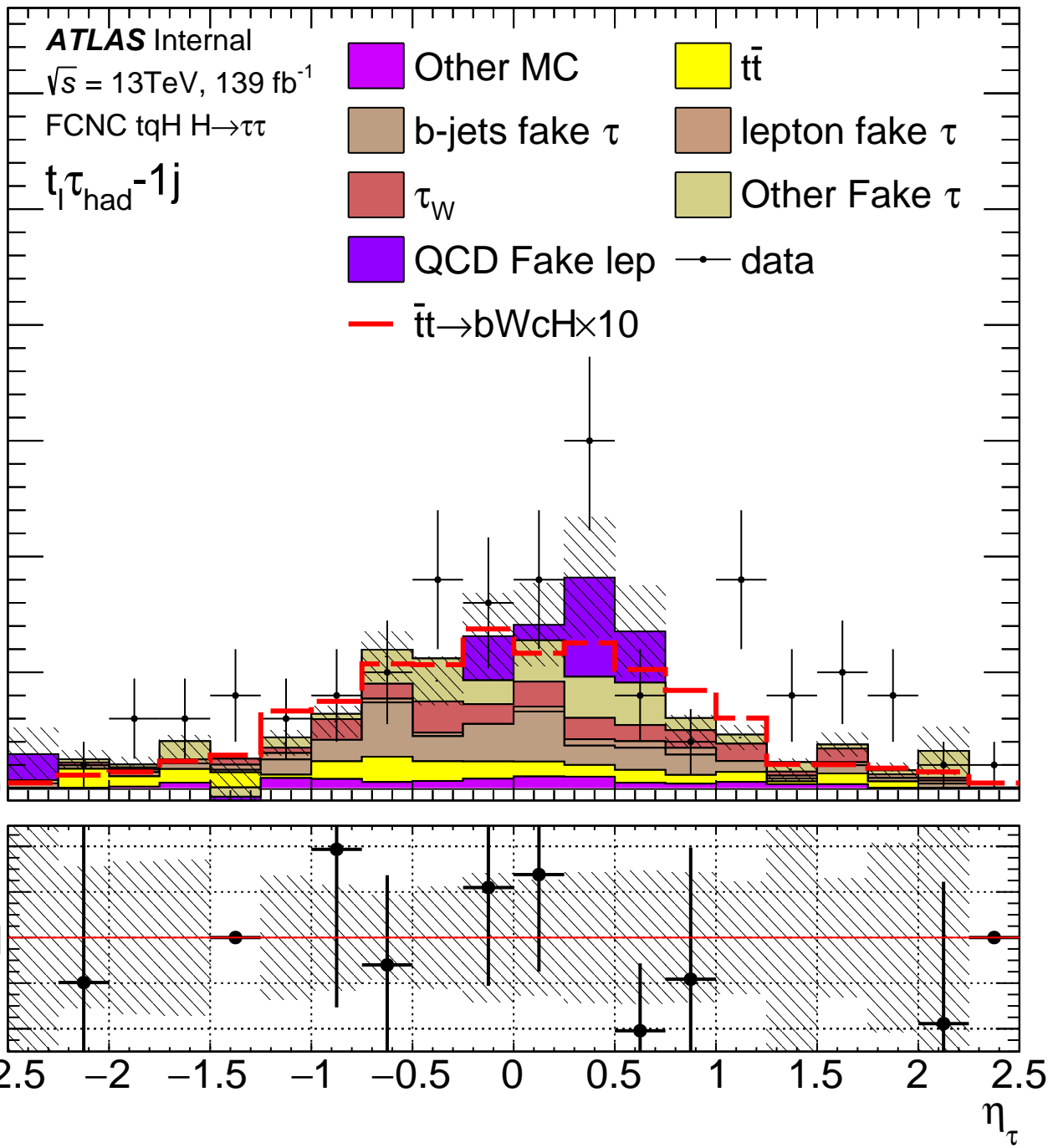
1.4

1.2

1.0

0.8

0.6

 $\eta_\tau$ 

Events / 0.25

**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$

$t_l \tau_{\text{had}}^{-1} j$

Other MC

b-jets fake  $\tau$

$\tau_W$

QCD Fake lep

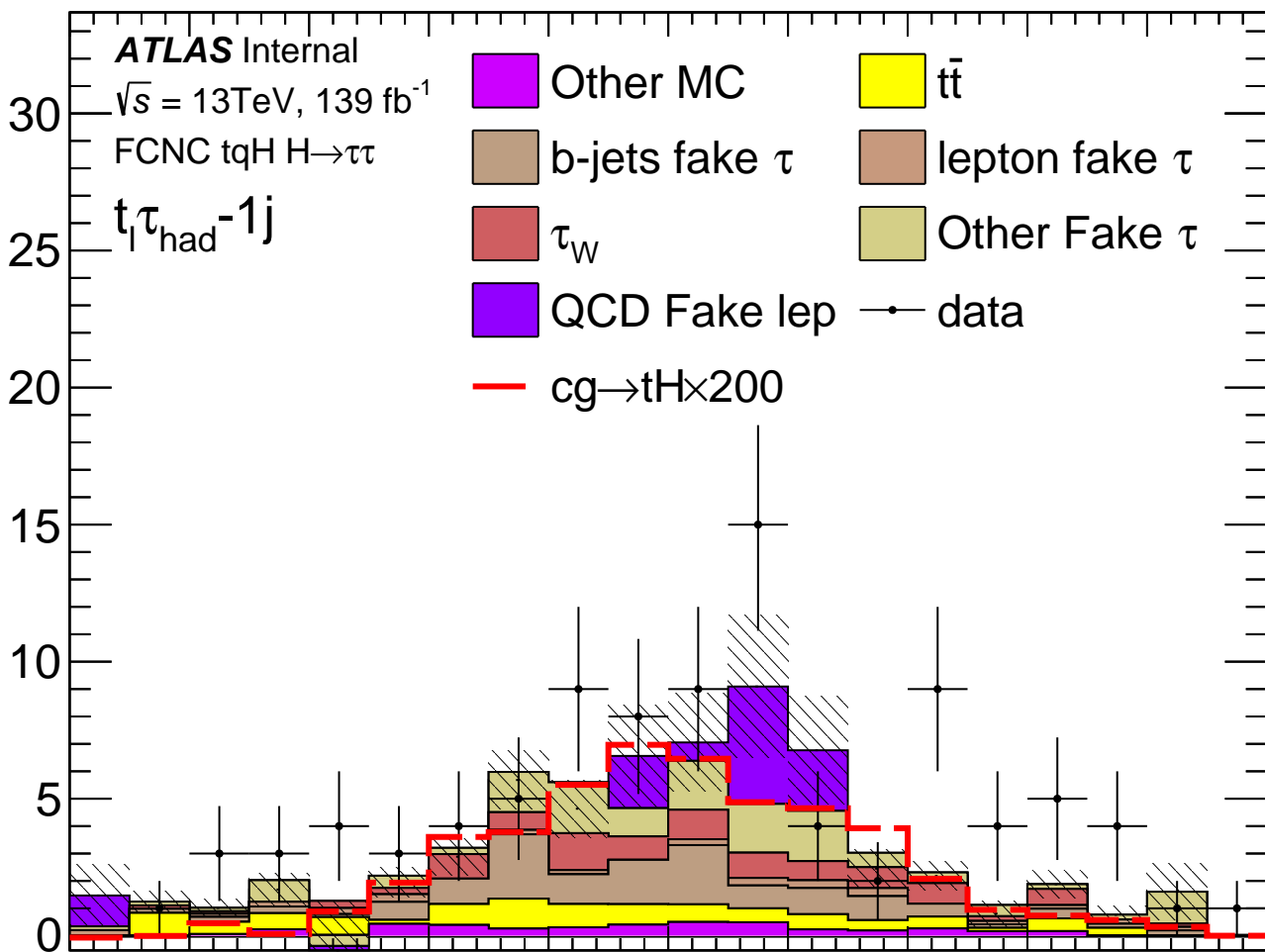
$cg \rightarrow tH \times 200$

$t\bar{t}$

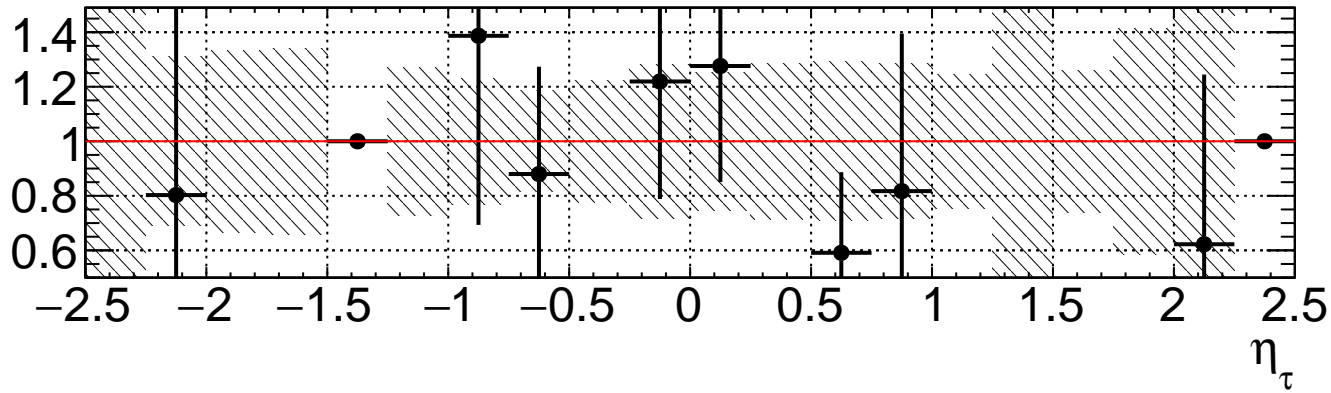
lepton fake  $\tau$

Other Fake  $\tau$

data



Data/Bkg



Events / 0.25

**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$   
 $t_l \tau_{\text{had}}^{-1} j$

Other MC

b-jets fake  $\tau$  $\tau_W$ 

QCD Fake lep

 $u\bar{g} \rightarrow t\bar{H} \times 80$  $t\bar{t}$ lepton fake  $\tau$ Other Fake  $\tau$ 

data

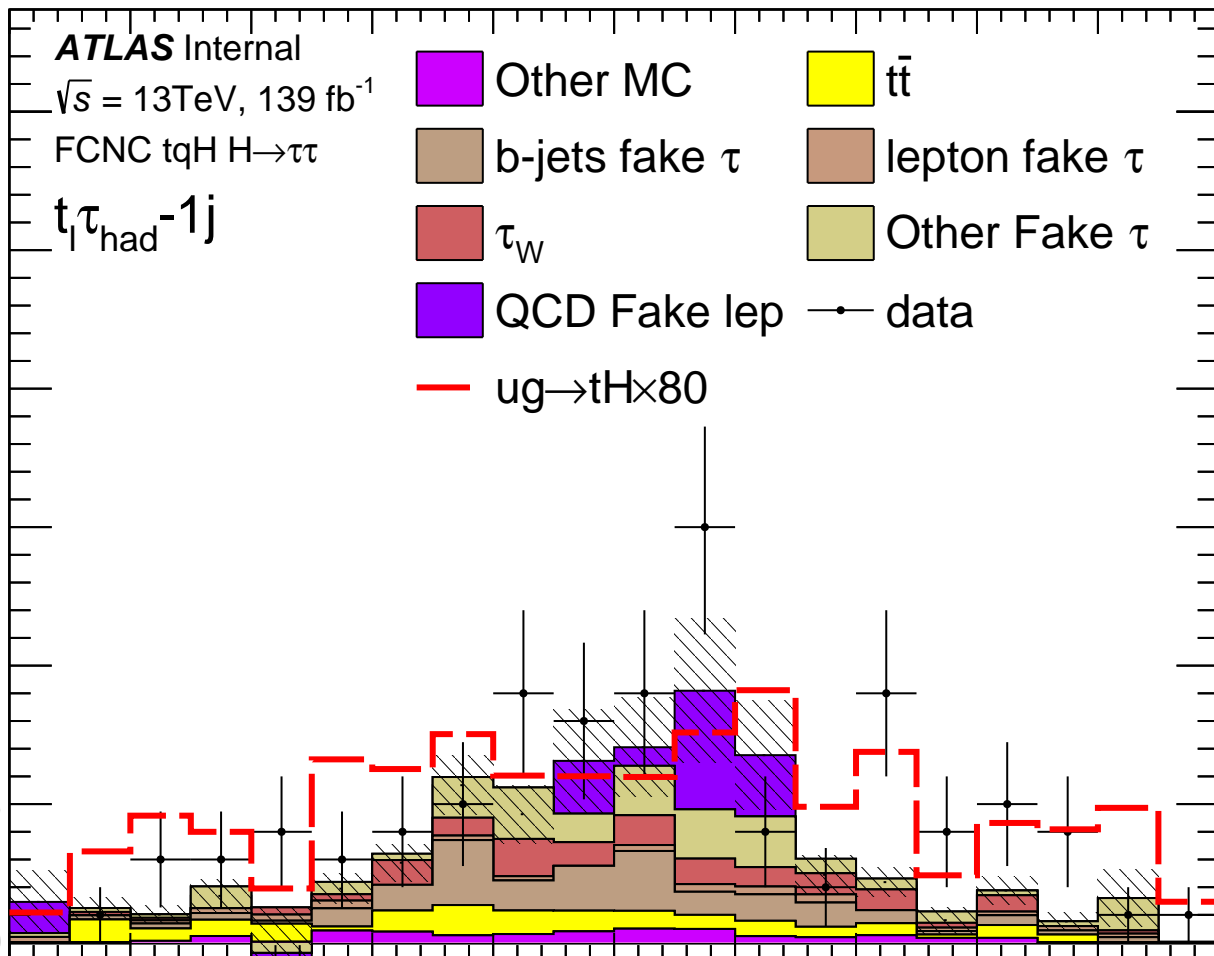
20

15

10

5

0



Data/Bkg

1.4

1.2

1.0

0.8

0.6

 $\eta_\tau$

Events / 0.25

**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$

$t_l\tau_{\text{had}}^{-1}j$

Other MC

b-jets fake  $\tau$

$\tau_W$

QCD Fake lep

tcH merged $\times 10$

$t\bar{t}$

lepton fake  $\tau$

Other Fake  $\tau$

data

30

25

20

15

10

5

0

Data/Bkg

1.4

1.2

1.0

0.8

0.6

-2.5

-2

-1.5

-1

-0.5

0

0.5

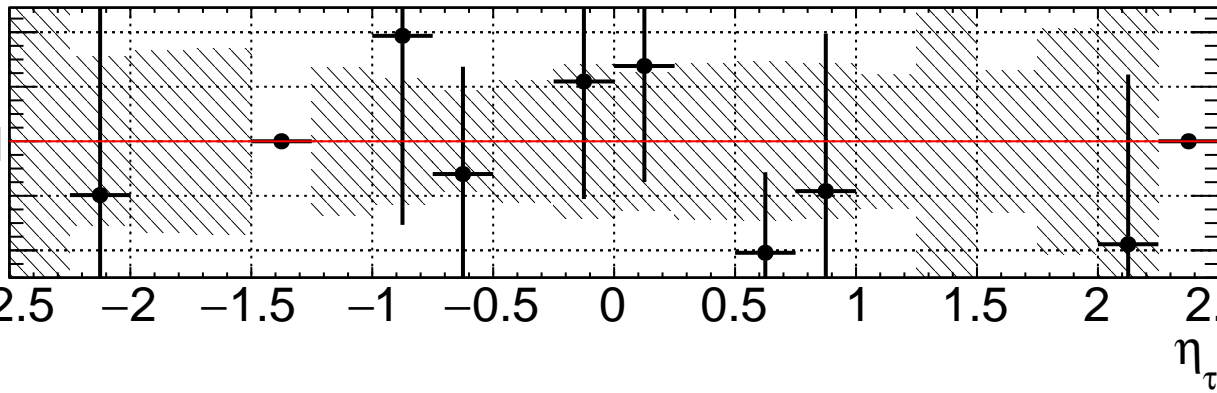
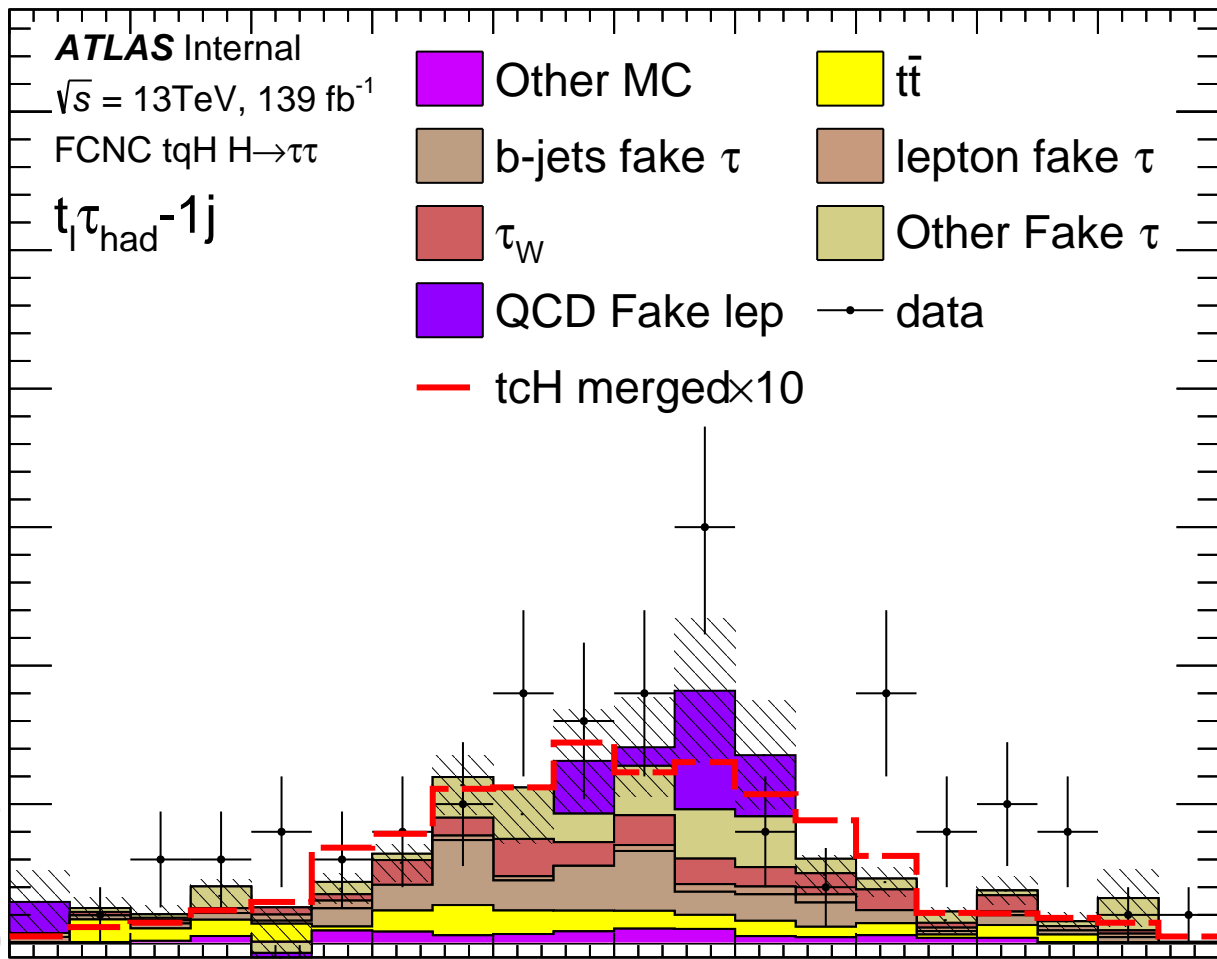
1

1.5

2

2.5

$\eta_\tau$



Events / 0.25

**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$   
 $t_l \tau_{\text{had}}^{-1} j$

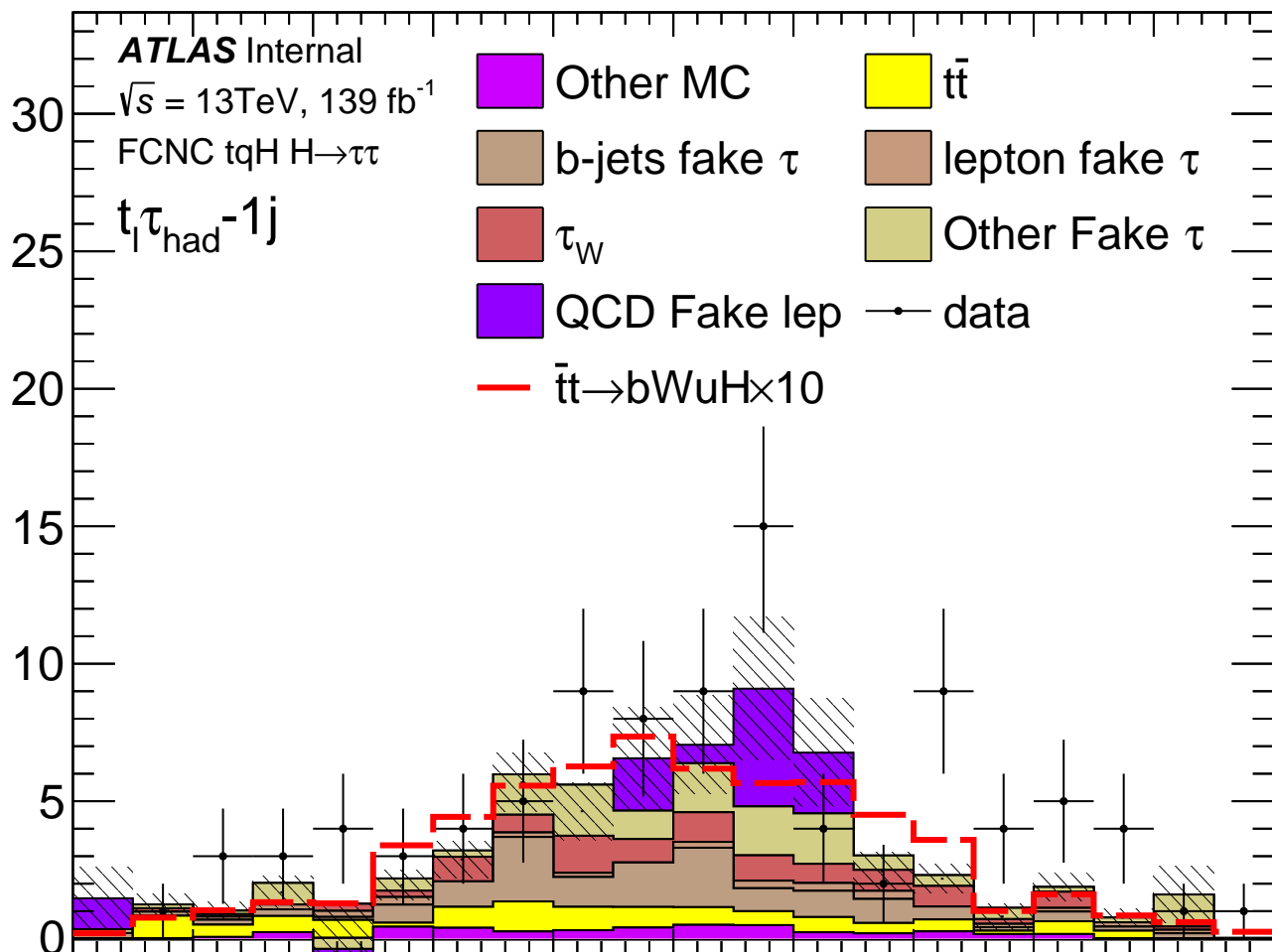
Other MC

b-jets fake  $\tau$  $\tau_W$ 

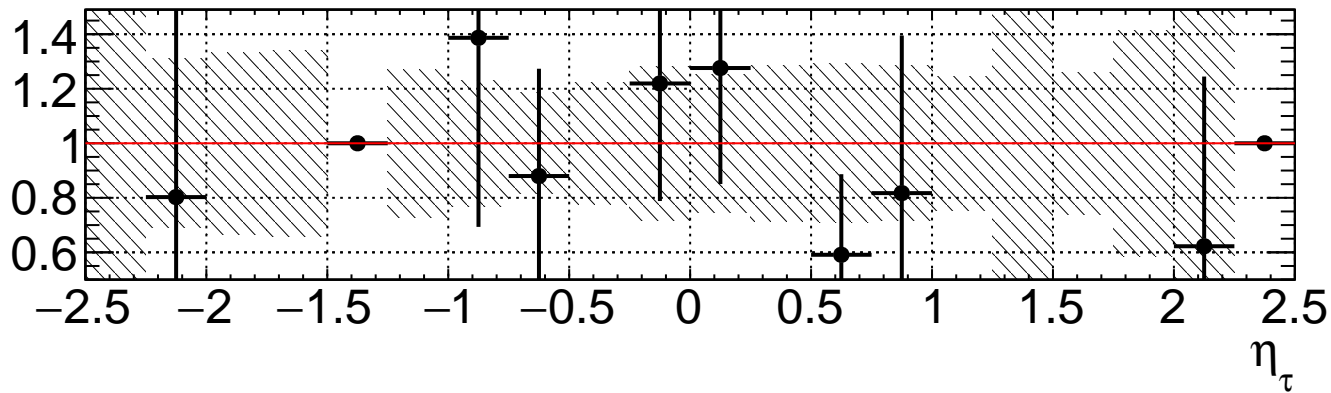
QCD Fake lep

 $\bar{t}t \rightarrow bWuH \times 10$  $t\bar{t}$ lepton fake  $\tau$ Other Fake  $\tau$ 

data



Data/Bkg



Events / 0.25

**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$

$t_l \tau_{\text{had}}^{-1} j$

Other MC

b-jets fake  $\tau$

$\tau_W$

QCD Fake lep

$t\bar{u}H \text{ WWZZ} \times 80$

$t\bar{t}$

lepton fake  $\tau$

Other Fake  $\tau$

data

30

25

20

15

10

5

0

Data/Bkg

1.4

1.2

1.0

0.8

0.6

-2.5

-2

-1.5

-1

-0.5

0

0.5

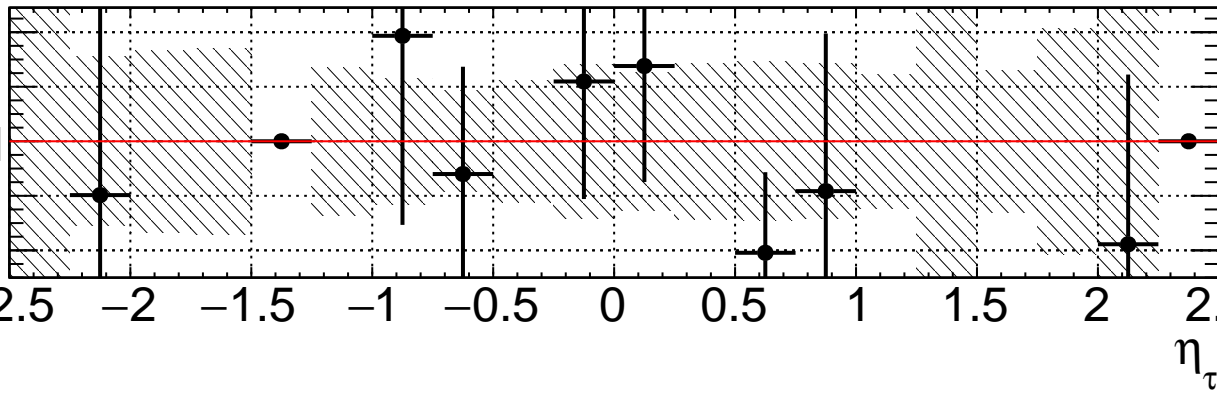
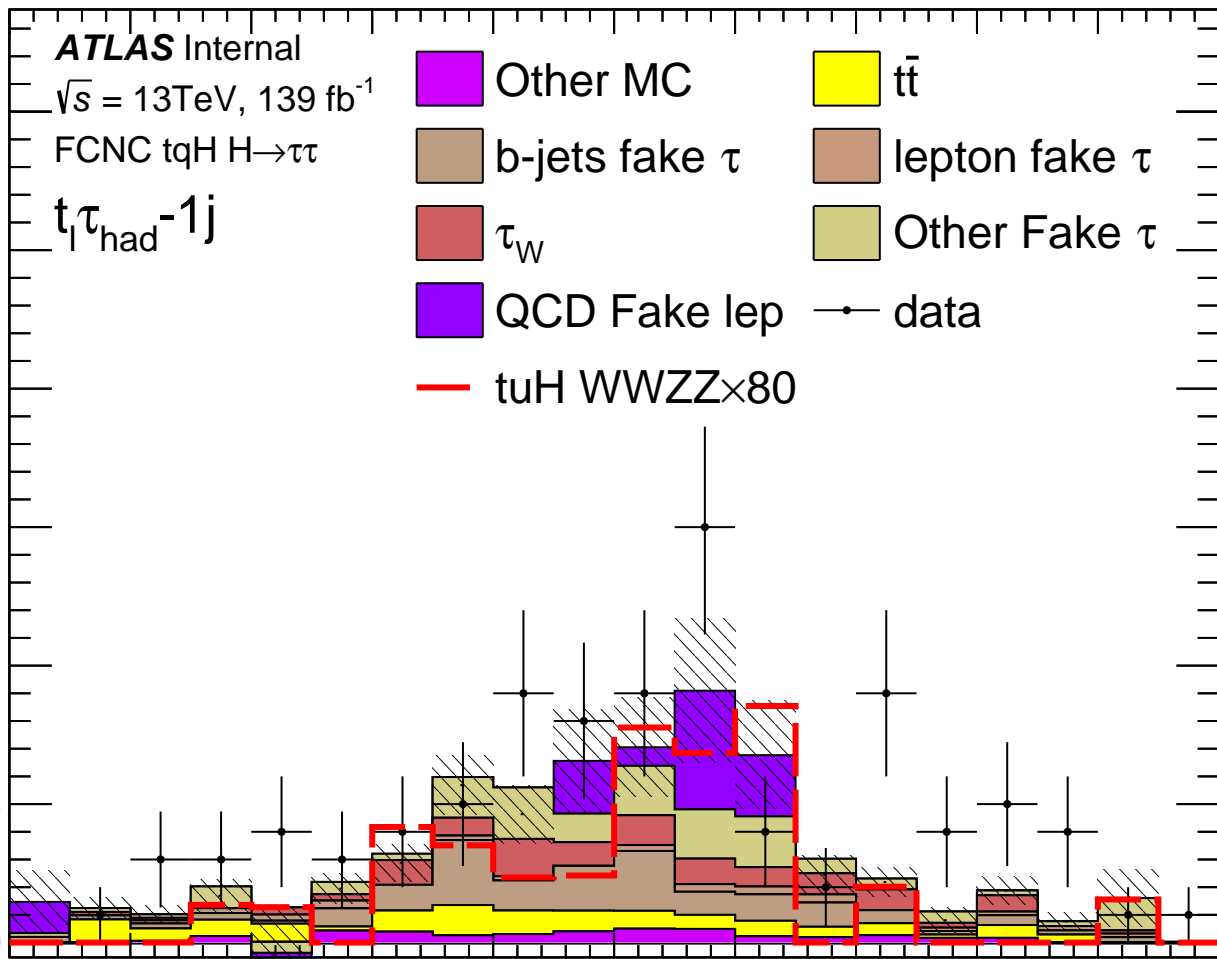
1

1.5

2

2.5

$\eta_\tau$



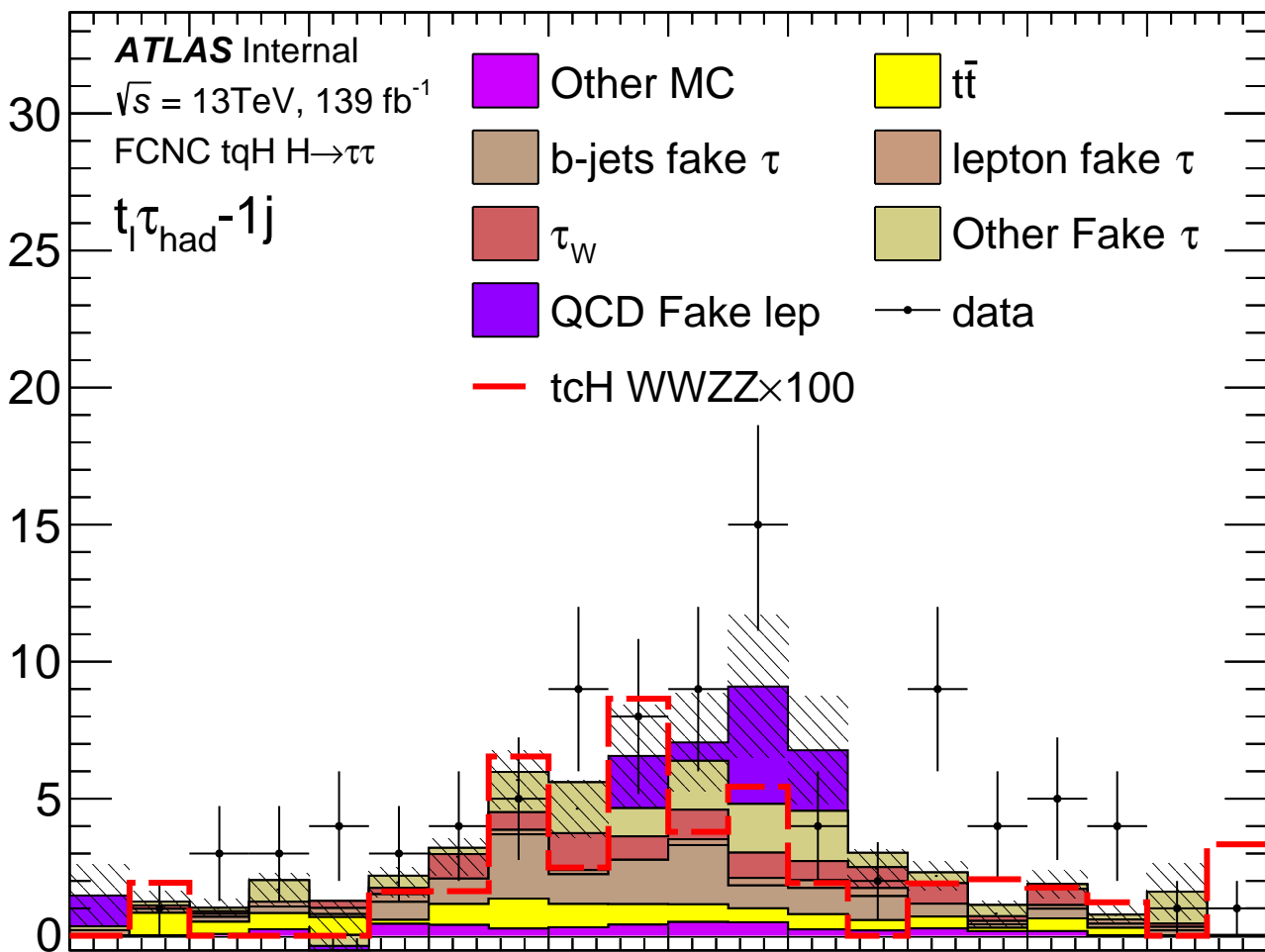
Events / 0.25

**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$

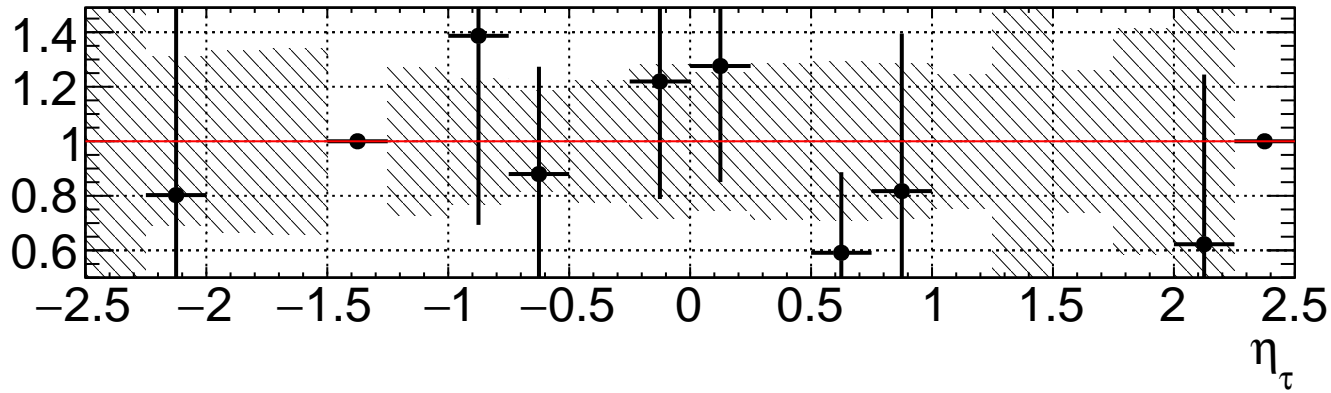
$t_l \tau_{\text{had}}^{-1} j$

Other MC  
b-jets fake  $\tau$   
 $\tau_W$   
QCD Fake lep  
tcH WWZZ $\times 100$

$t\bar{t}$   
lepton fake  $\tau$   
Other Fake  $\tau$   
data

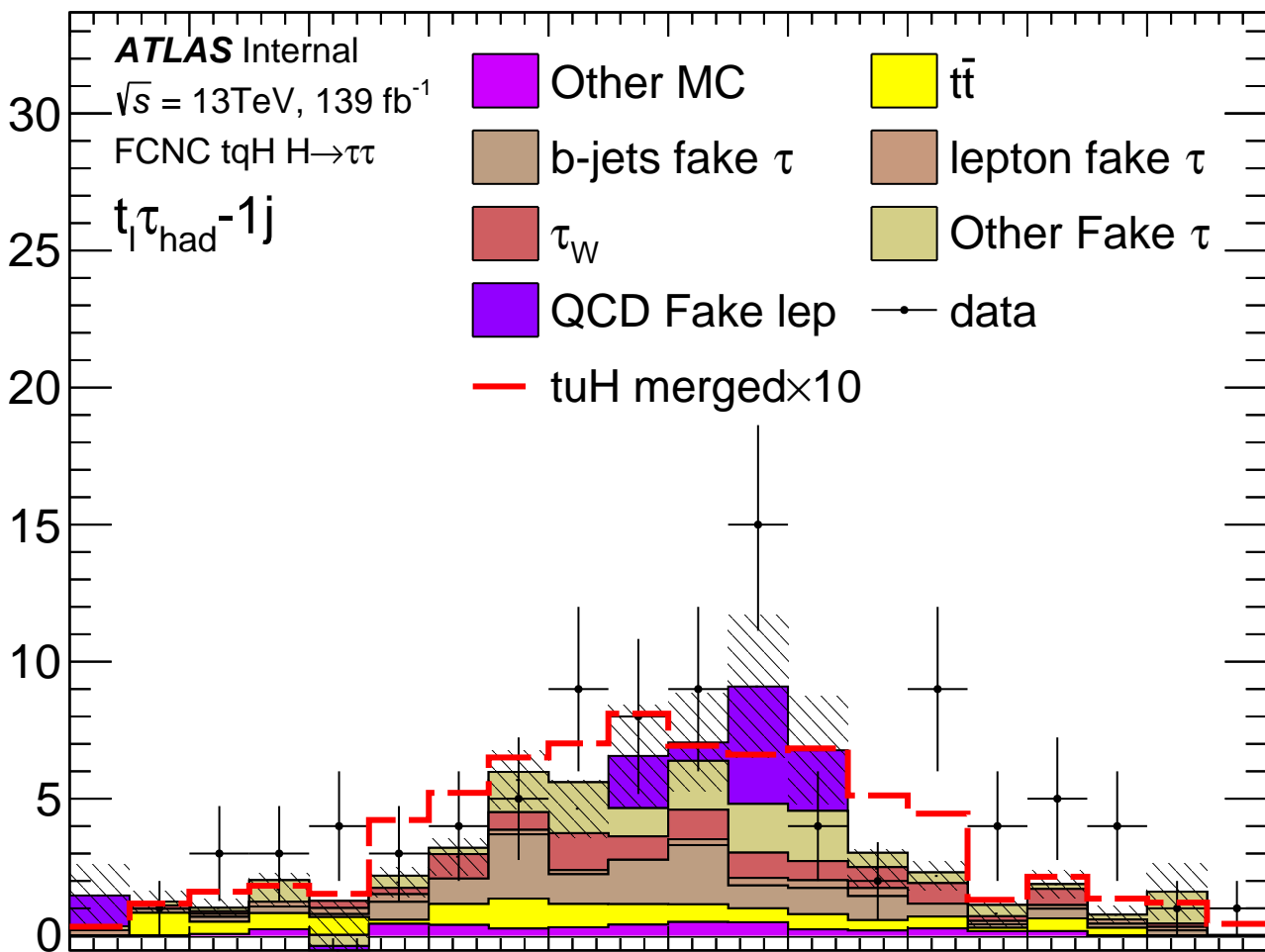
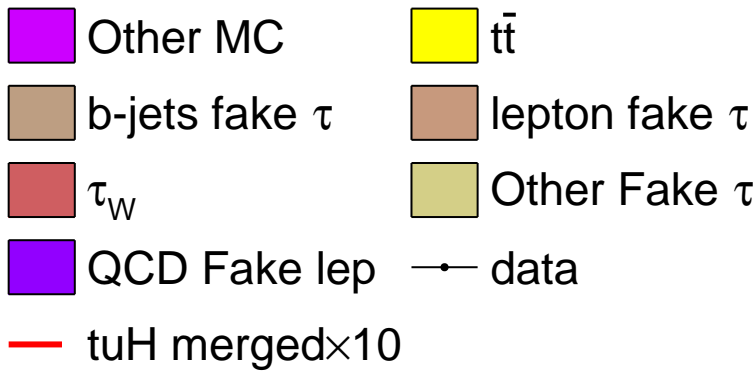


Data/Bkg

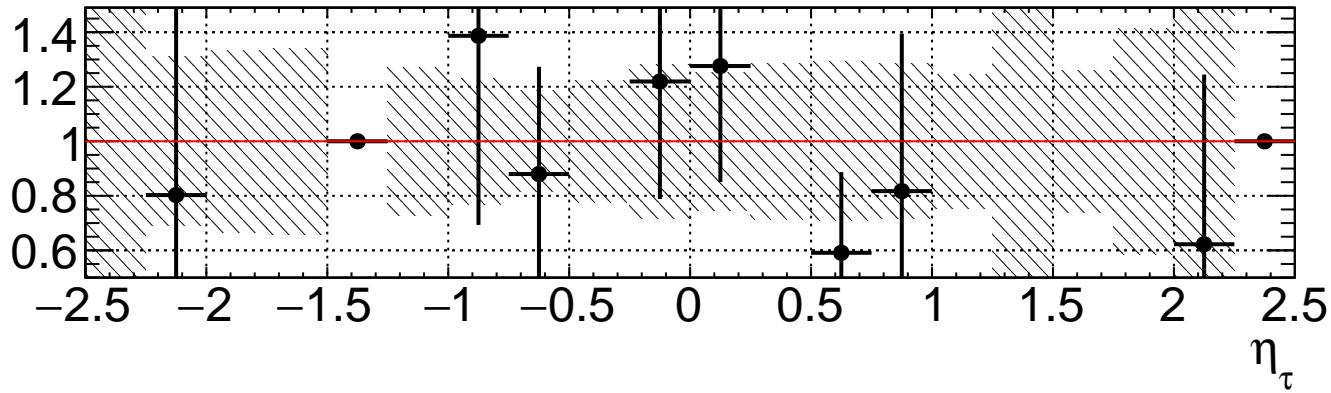


Events / 0.25

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 $t_l\tau_{\text{had}}^{-1}j$



Data/Bkg

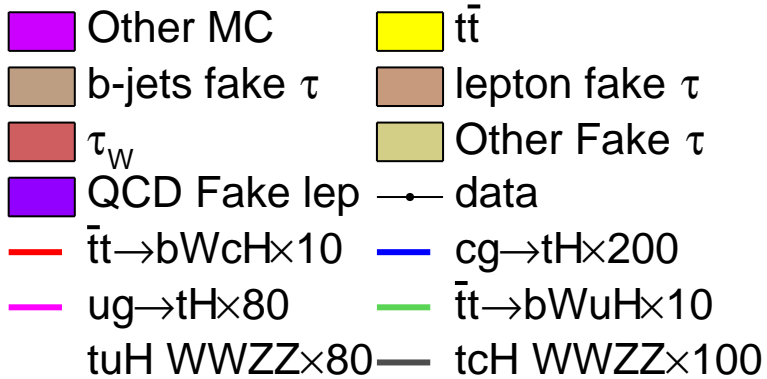




Events / 0.25

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FCNC  $t\bar{q}H \rightarrow \tau\tau$

$t_l \tau_{\text{had}}^{-1} j$



30

25

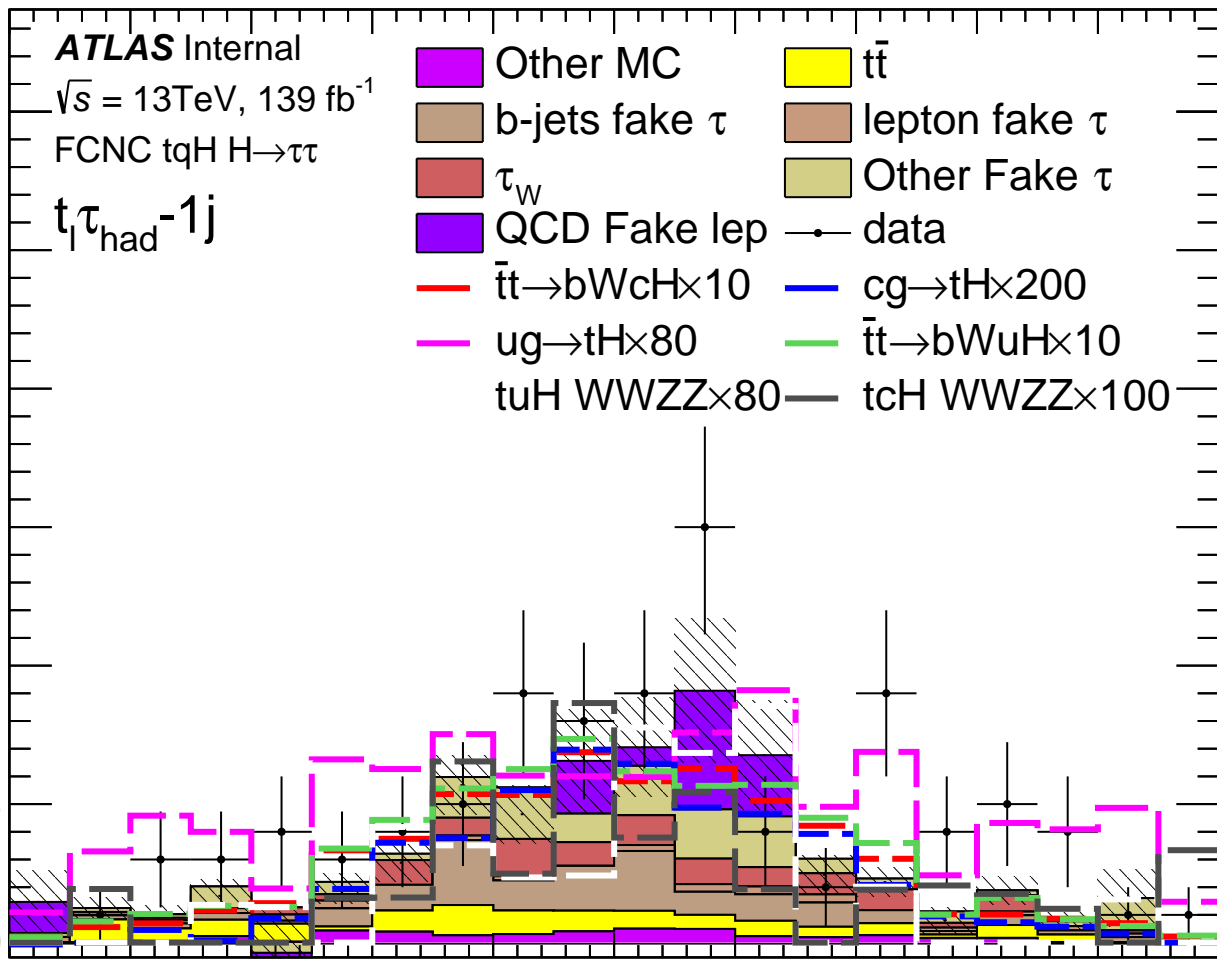
20

15

10

5

0



Data/Bkg

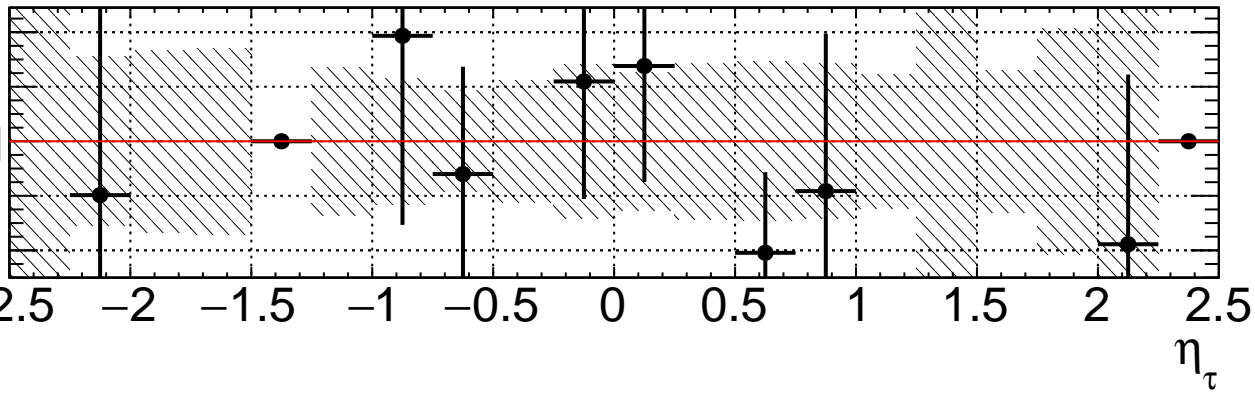
1.4

1.2

1.0

0.8

0.6

 $\eta_\tau$