

Events / 0.25

**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$

FCNC  $t\bar{q}H \rightarrow \tau\tau$  $t_h \tau_{\text{lep}} \tau_{\text{had}} - 2j$ 

Other MC

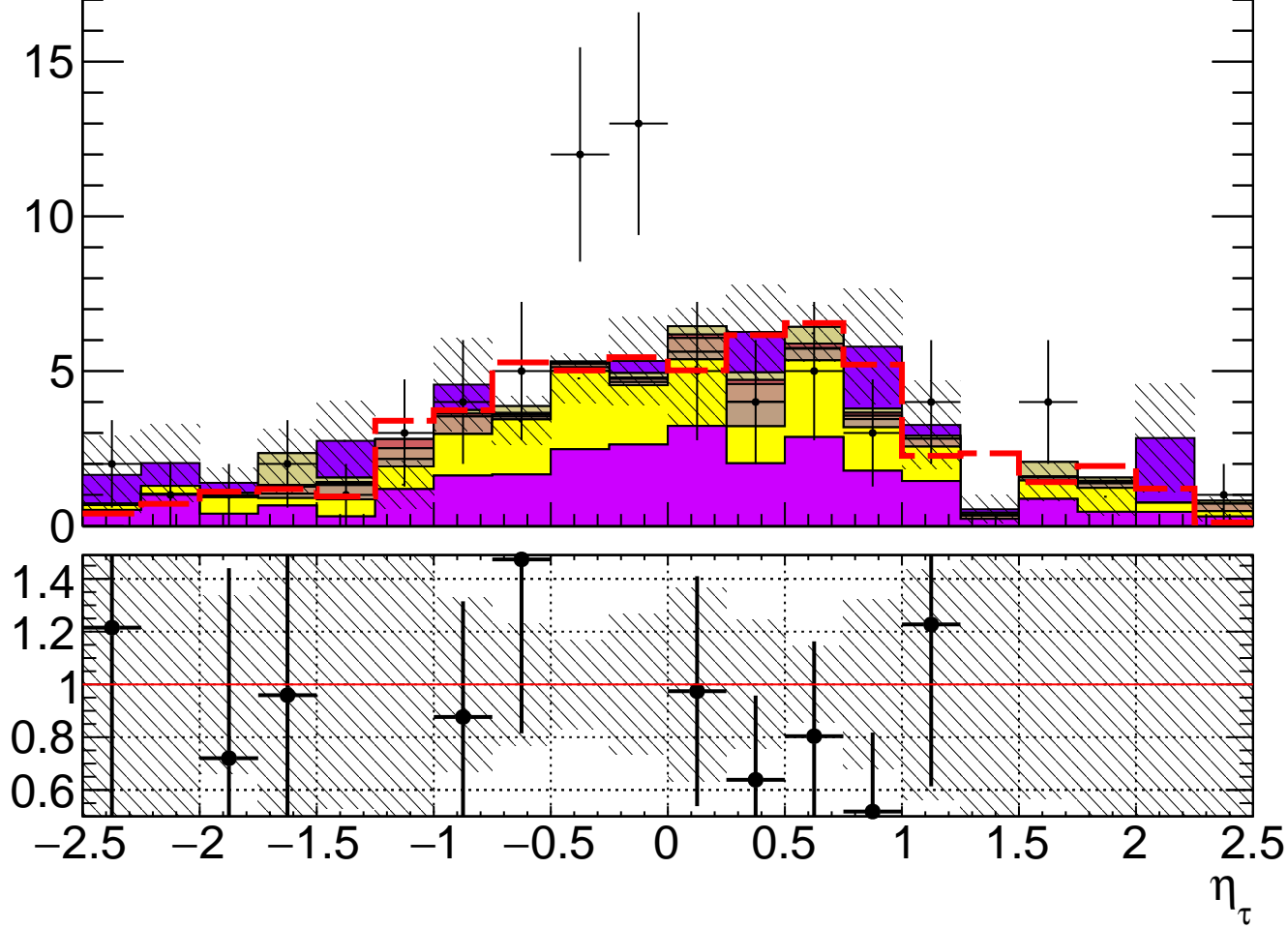
b-jets fake  $\tau$  $\tau_W$ 

QCD Fake lep

 $\bar{t}t \rightarrow bWcH \times 20$  $t\bar{t}$ lepton fake  $\tau$ Other Fake  $\tau$ 

data

Data/Bkg



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**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$   
 $t_h \tau_{\text{lep}} \tau_{\text{had}} - 2j$

Other MC

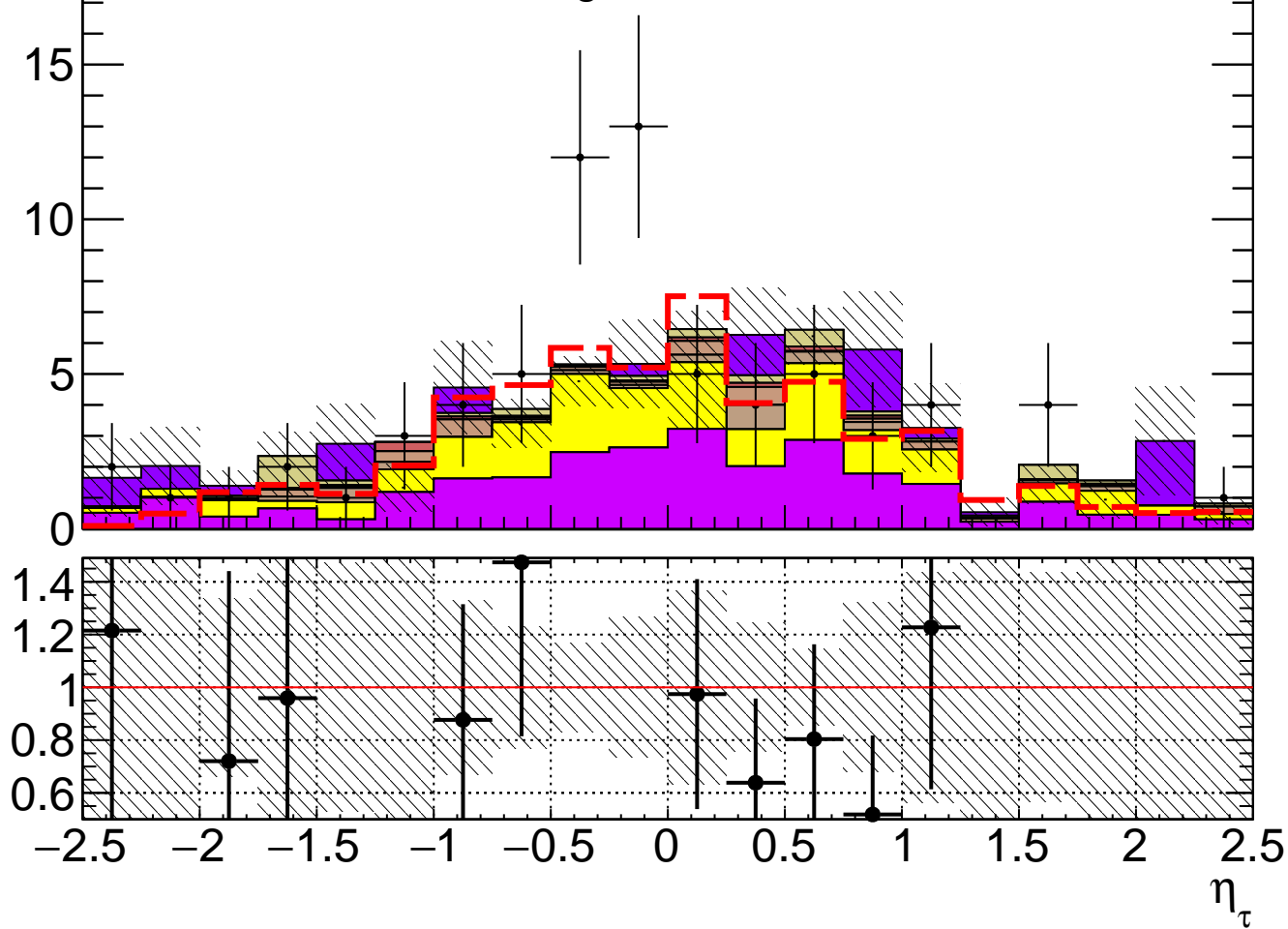
b-jets fake  $\tau$  $\tau_W$ 

QCD Fake lep

 $cg \rightarrow t\bar{t}H \times 100$  $t\bar{t}$ lepton fake  $\tau$ Other Fake  $\tau$ 

data

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 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$   
 $t_h \tau_{\text{lep}} \tau_{\text{had}} - 2j$

Other MC

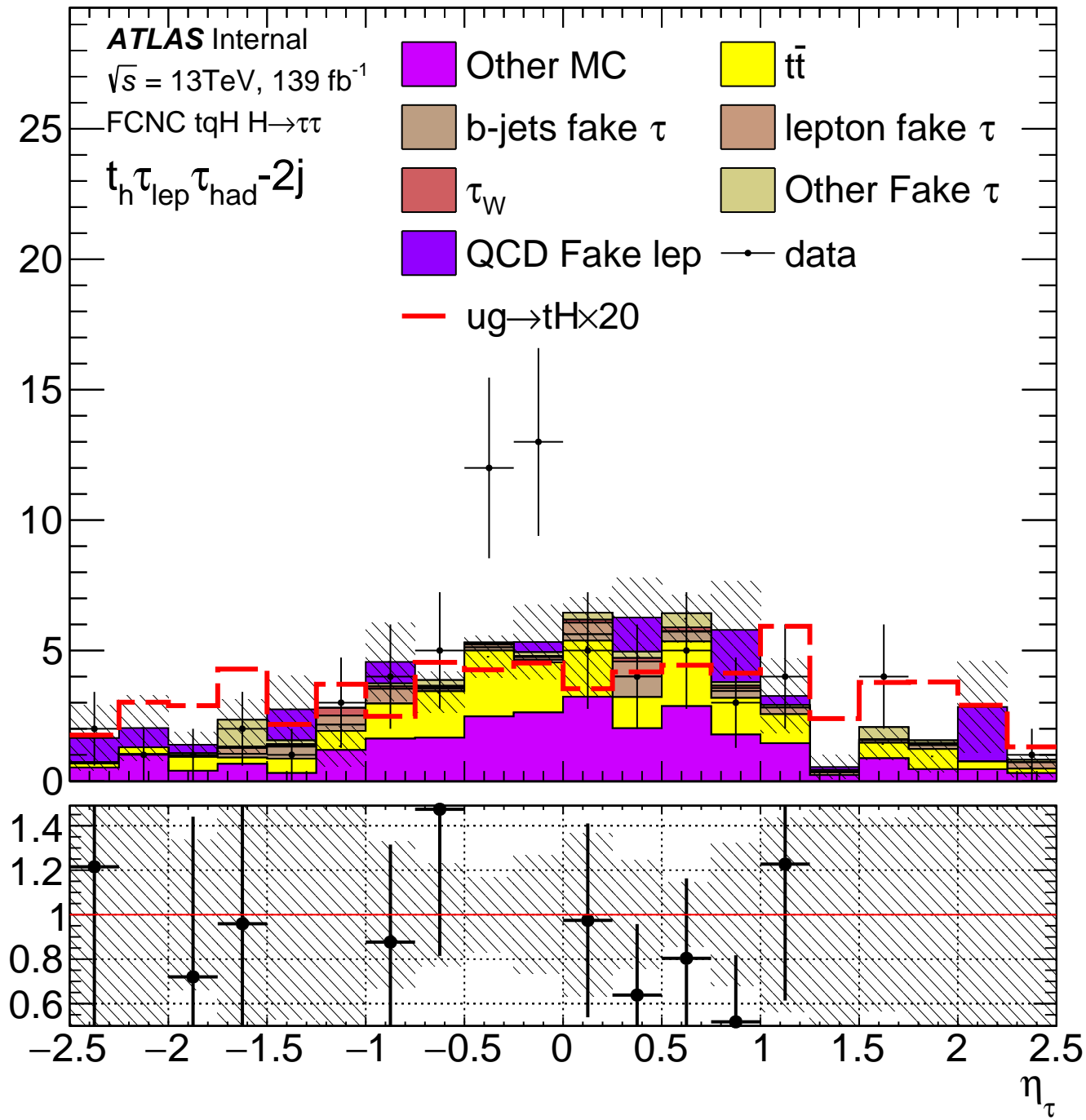
b-jets fake  $\tau$  $\tau_W$ 

QCD Fake lep

 $u\bar{g} \rightarrow t\bar{t}H \times 20$  $t\bar{t}$ lepton fake  $\tau$ Other Fake  $\tau$ 

data

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**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow H \rightarrow \tau\tau$   
 $t_h \tau_{\text{lep}} \tau_{\text{had}} - 2j$

Other MC

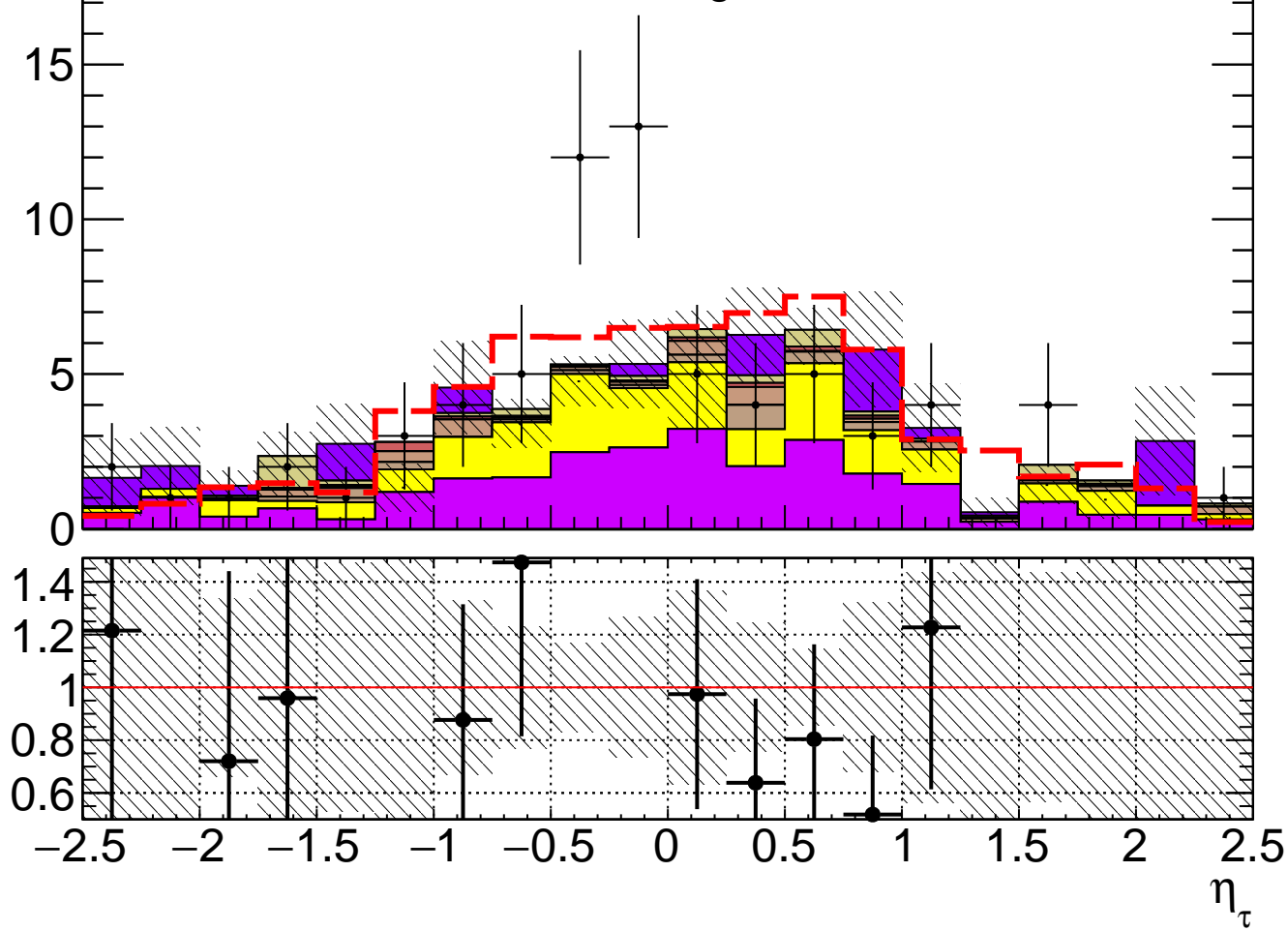
b-jets fake  $\tau$  $\tau_W$ 

QCD Fake lep

tcH merged $\times 20$  $t\bar{t}$ lepton fake  $\tau$ Other Fake  $\tau$ 

data

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 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC  $t\bar{q}H \rightarrow \tau\tau$   
 $t_h \tau_{\text{lep}} \tau_{\text{had}} - 2j$

Other MC

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

QCD Fake lep

 $\bar{t}\bar{t} \rightarrow bWuH \times 20$  $t\bar{t}$ lepton fake  $\tau$ Other Fake  $\tau$ 

data

25

20

15

10

5

0

Data/Bkg

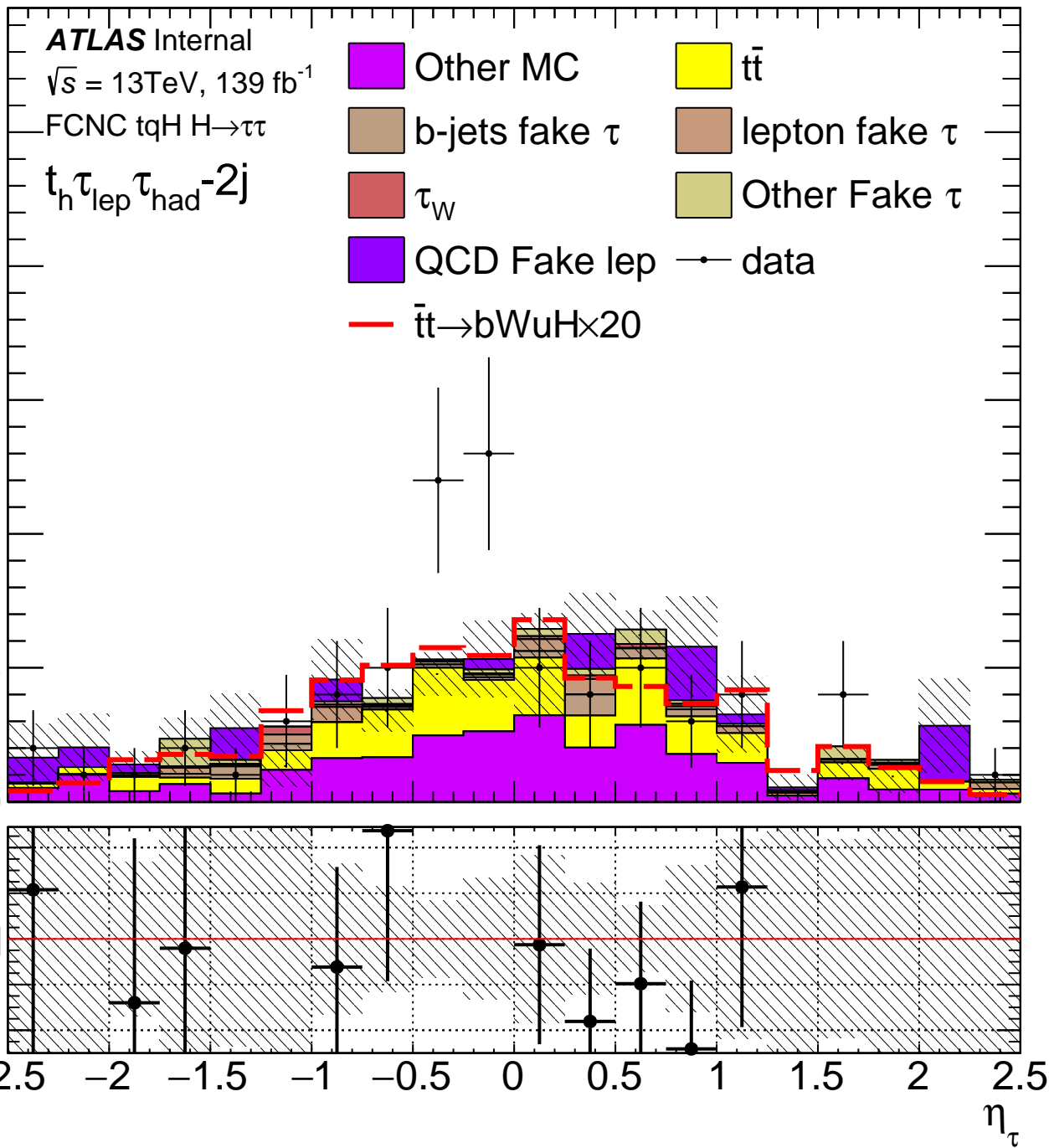
1.4

1.2

1.0

0.8

0.6

 $\eta_\tau$ 

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**ATLAS** Internal $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$ FCNC tqH  $H \rightarrow \tau\tau$  $t_h \tau_{\text{lep}} \tau_{\text{had}}^{-2j}$ 

Other MC

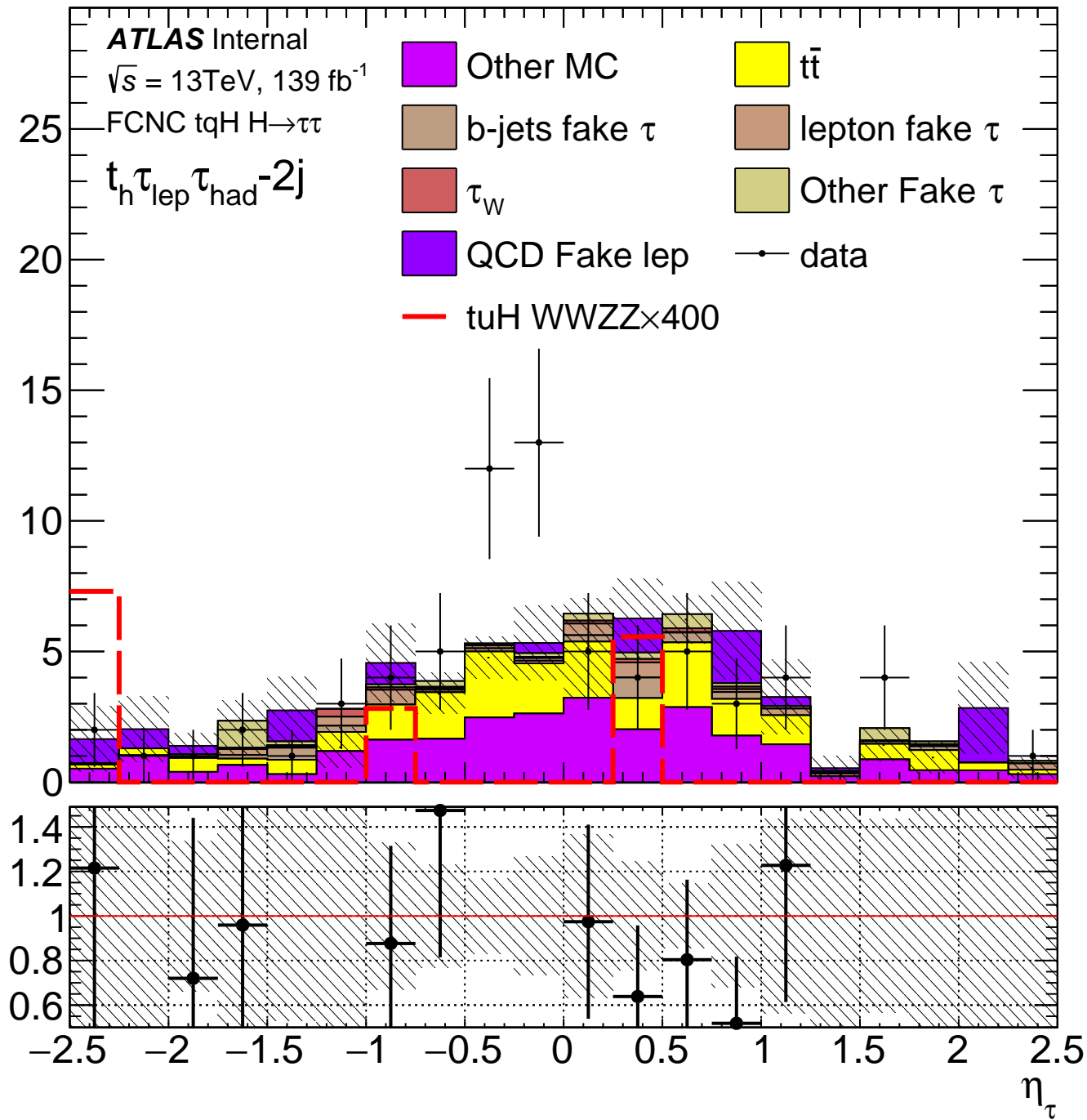
b-jets fake  $\tau$  $\tau_W$ 

QCD Fake lep

—  $tuH\text{ WWZZ} \times 400$  $t\bar{t}$ lepton fake  $\tau$ Other Fake  $\tau$ 

—•— data

Data/Bkg

 $\eta_\tau$ 

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**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC tqH  $H \rightarrow \tau\tau$   
 $t_h \tau_{\text{lep}} \tau_{\text{had}} - 2j$

Other MC

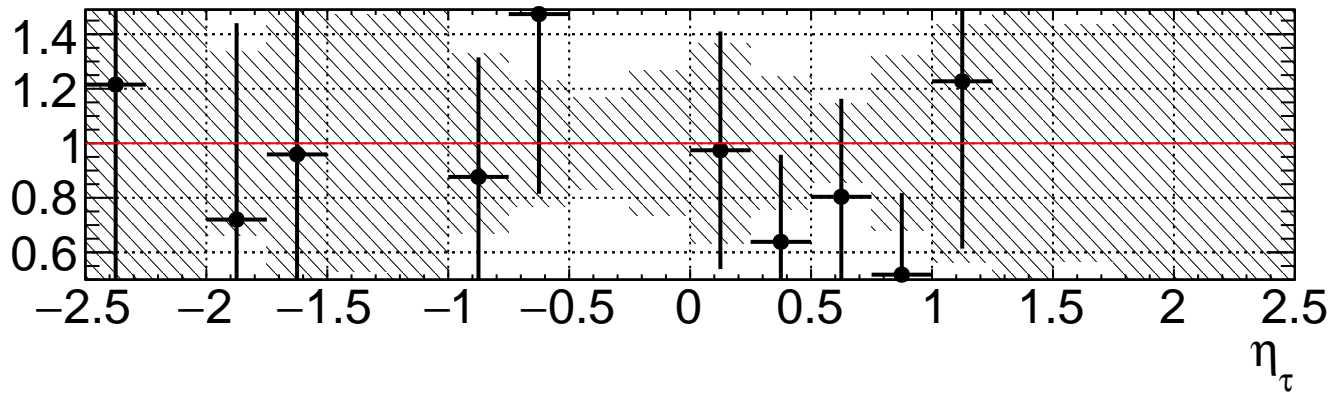
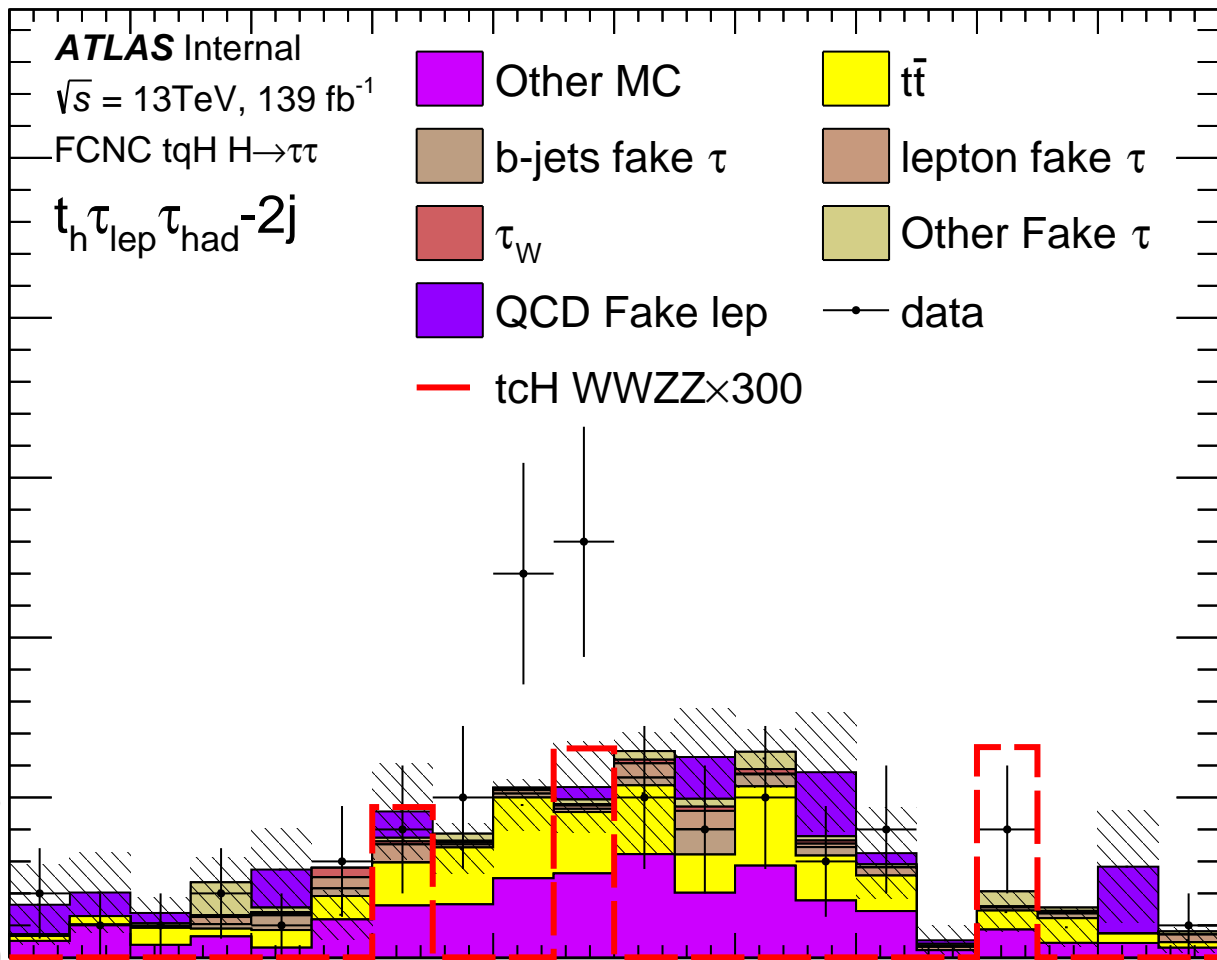
b-jets fake  $\tau$  $\tau_W$ 

QCD Fake lep

tcH WWZZ $\times 300$  $t\bar{t}$ lepton fake  $\tau$ Other Fake  $\tau$ 

—•— data

Data/Bkg

 $\eta_\tau$ 

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 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$

FCNC tqH  $H \rightarrow \tau\tau$

$t_h \tau_{\text{lep}} \tau_{\text{had}} - 2j$

Other MC

b-jets fake  $\tau$

$\tau_W$

QCD Fake lep

tuH merged  $\times 10$

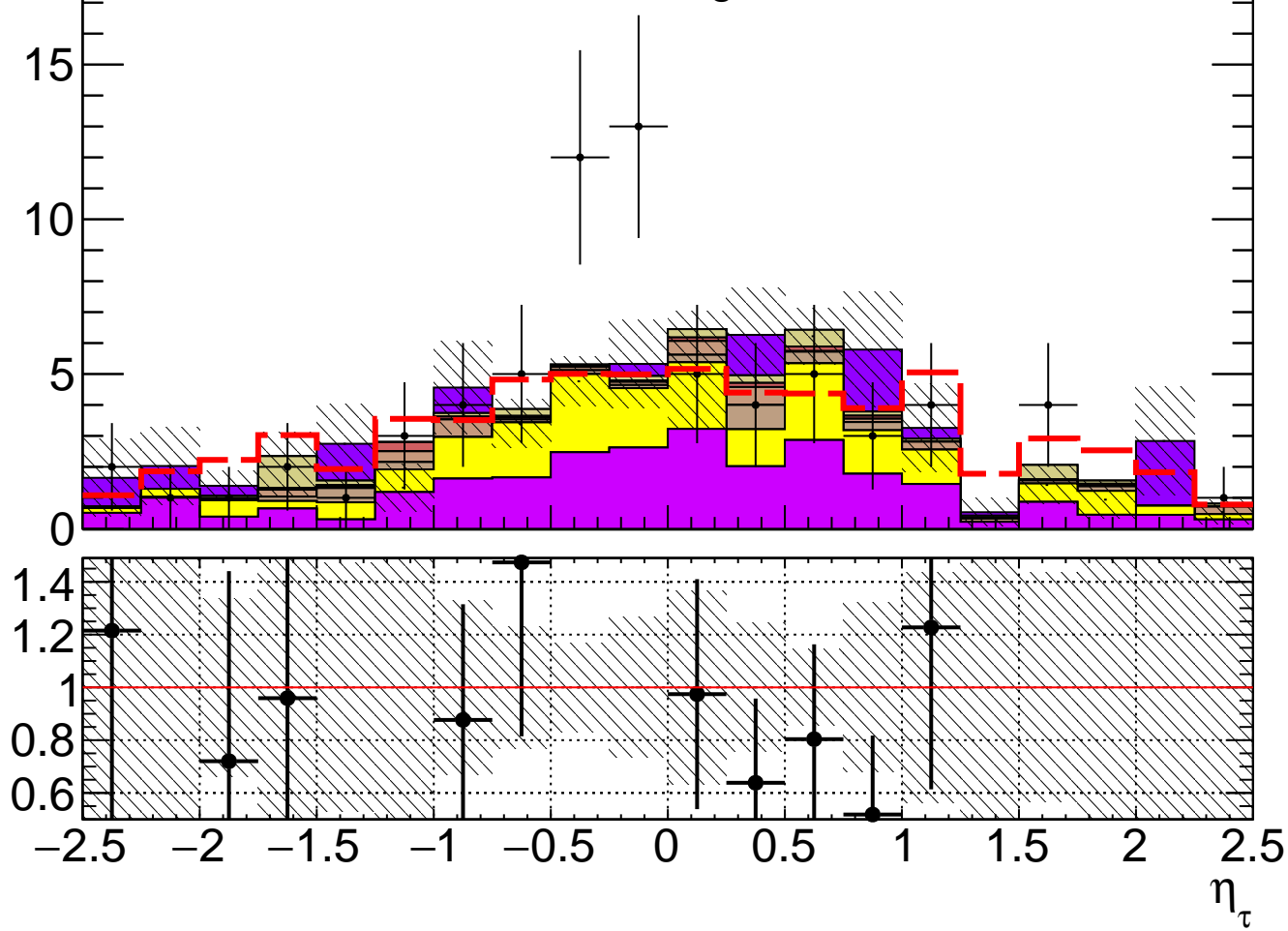
$t\bar{t}$

lepton fake  $\tau$

Other Fake  $\tau$

data















Data/Bkg





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**ATLAS** Internal  
 $\sqrt{s} = 13\text{TeV}, 139\text{ fb}^{-1}$   
FCNC tqH  $H \rightarrow \tau\tau$   
 $t_h \tau_{\text{lep}} \tau_{\text{had}} - 2j$

 Other MC	 $t\bar{t}$
 b-jets fake $\tau$	 lepton fake $\tau$
 $\tau_W$	 Other Fake $\tau$
 QCD Fake lep	 data
 $t\bar{t} \rightarrow bWcH \times 20$	 $cg \rightarrow tH \times 100$
 $ug \rightarrow tH \times 20$	 $t\bar{t} \rightarrow bWuH \times 20$
 $tuH WWZZ \times 400$	 $tcH WWZZ \times 300$

Data/Bkg

