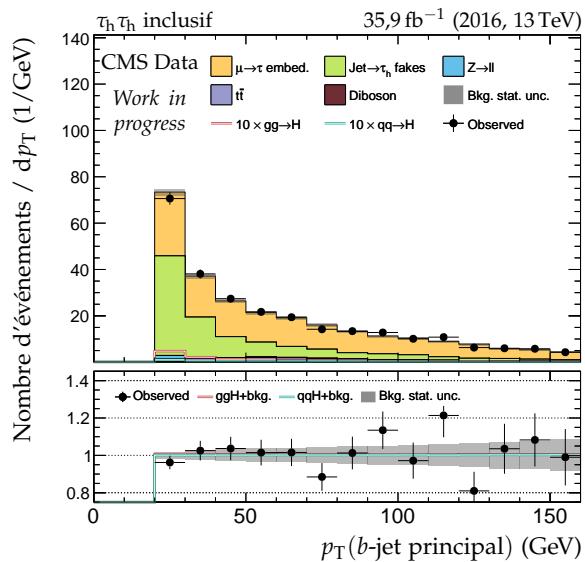
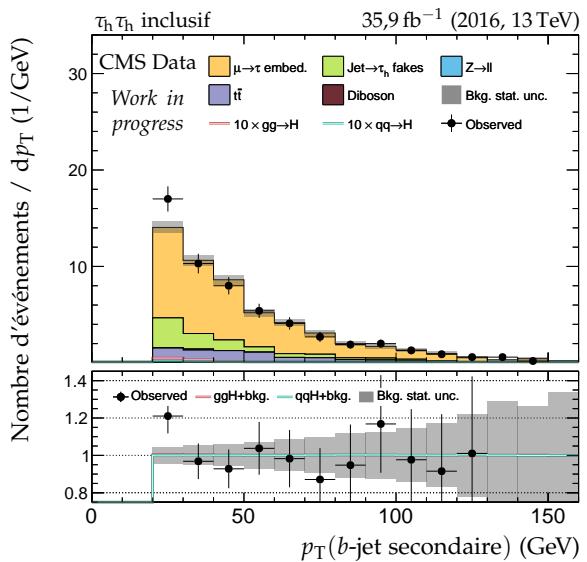


Annexe X
Distributions de contrôle – $H \rightarrow \tau\tau$

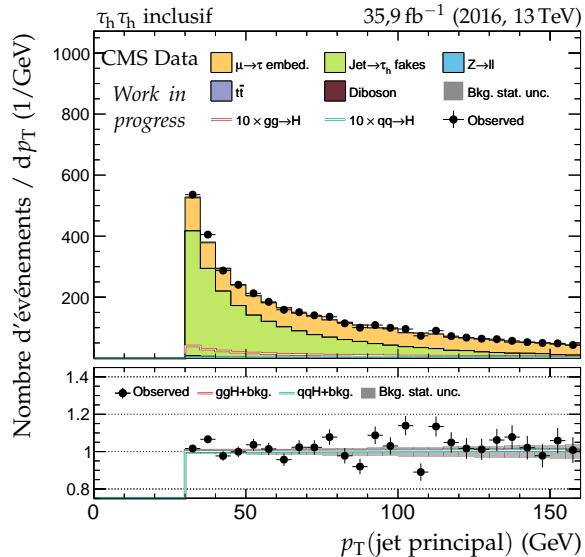
2 ANNEXE X. DISTRIBUTIONS DE CONTRÔLE – $H \rightarrow \tau\tau$



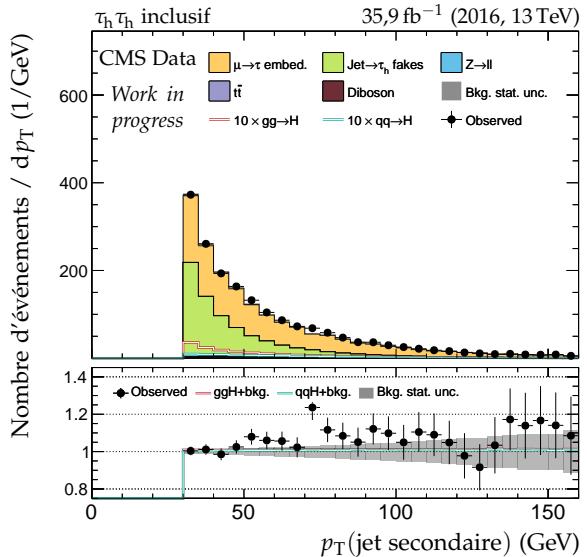
(a) Impulsion transverse du b-jet principal.



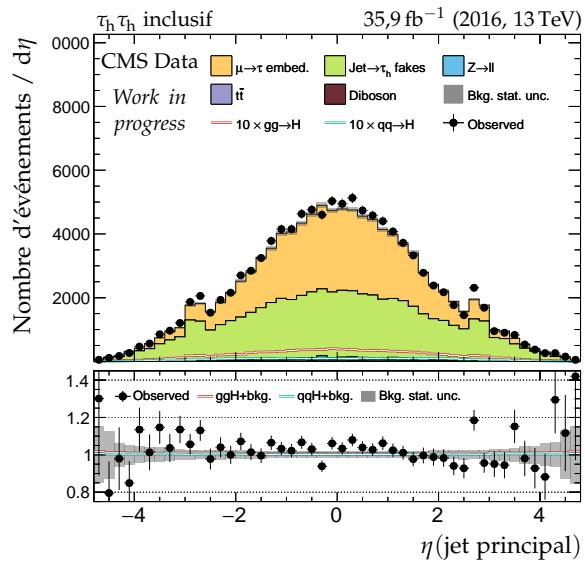
(b) Impulsion transverse du b-jet secondaire.



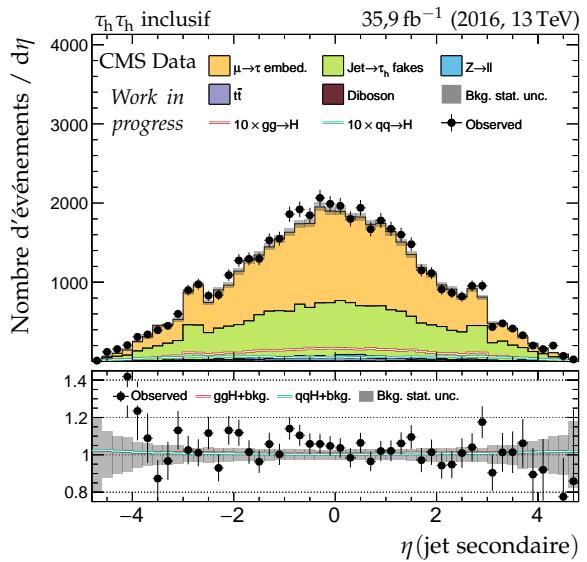
(c) Impulsion transverse du jet principal.



(d) Impulsion transverse du jet secondaire.



(e) Pseudo-rapidité du jet principal.



(f) Pseudo-rapidité du jet secondaire.

Figure X.1 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2016 : cinématique des jets.

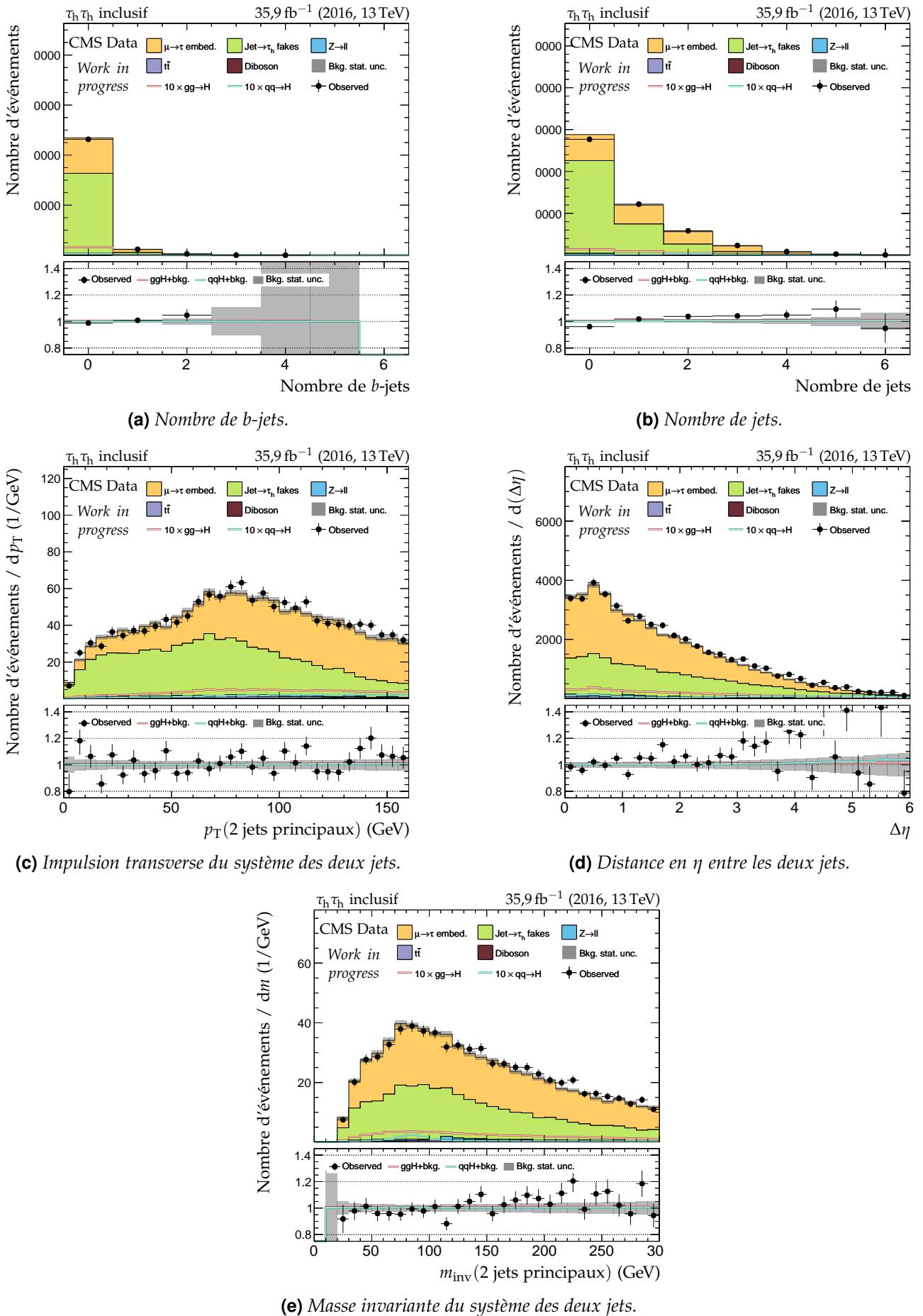
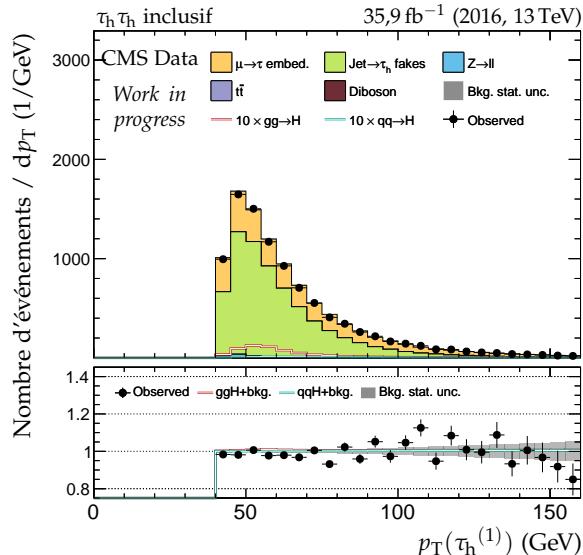
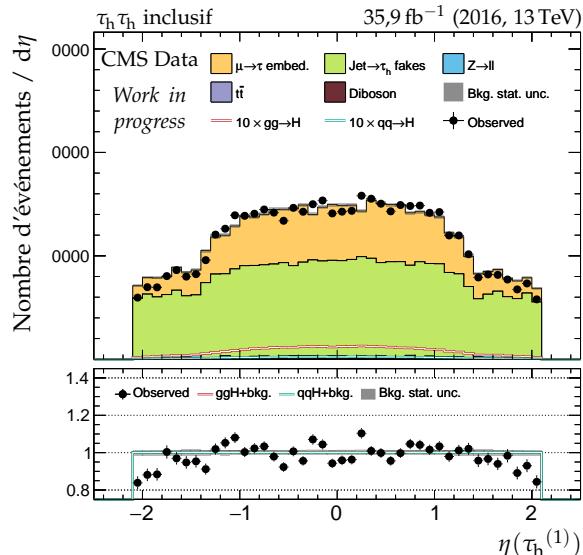


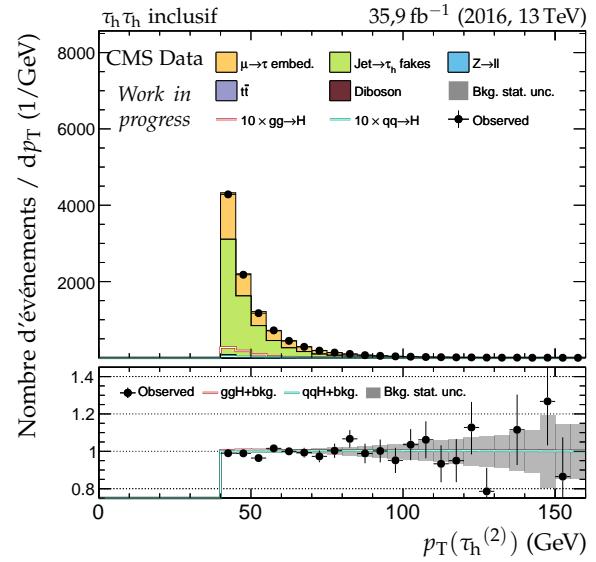
Figure X.2 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2016 : nombre de jets et système des deux jets principaux.



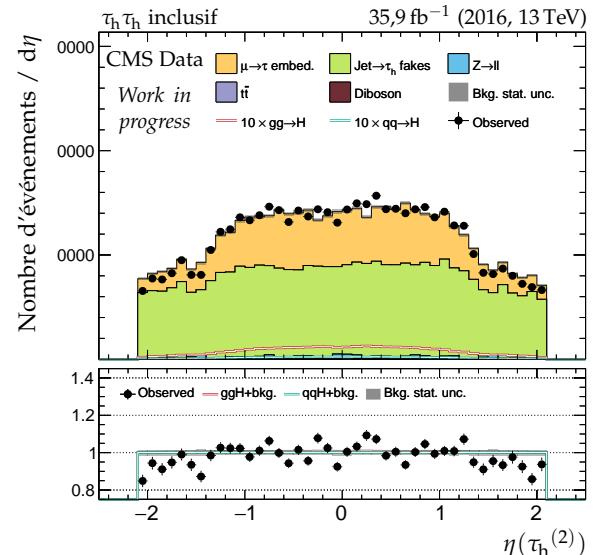
(a) Impulsion transverse du lepton 1 ($\tau_h^{(1)}$).



(c) Pseudo-rapidité transverse du lepton 1 ($\tau_h^{(1)}$).



(b) Impulsion transverse du lepton 2 ($\tau_h^{(2)}$).



(d) Pseudo-rapidité transverse du lepton 2 ($\tau_h^{(2)}$).

Figure X.3 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2016 : cinématique des leptons ($\tau_h^{(1)}, \tau_h^{(2)}$).

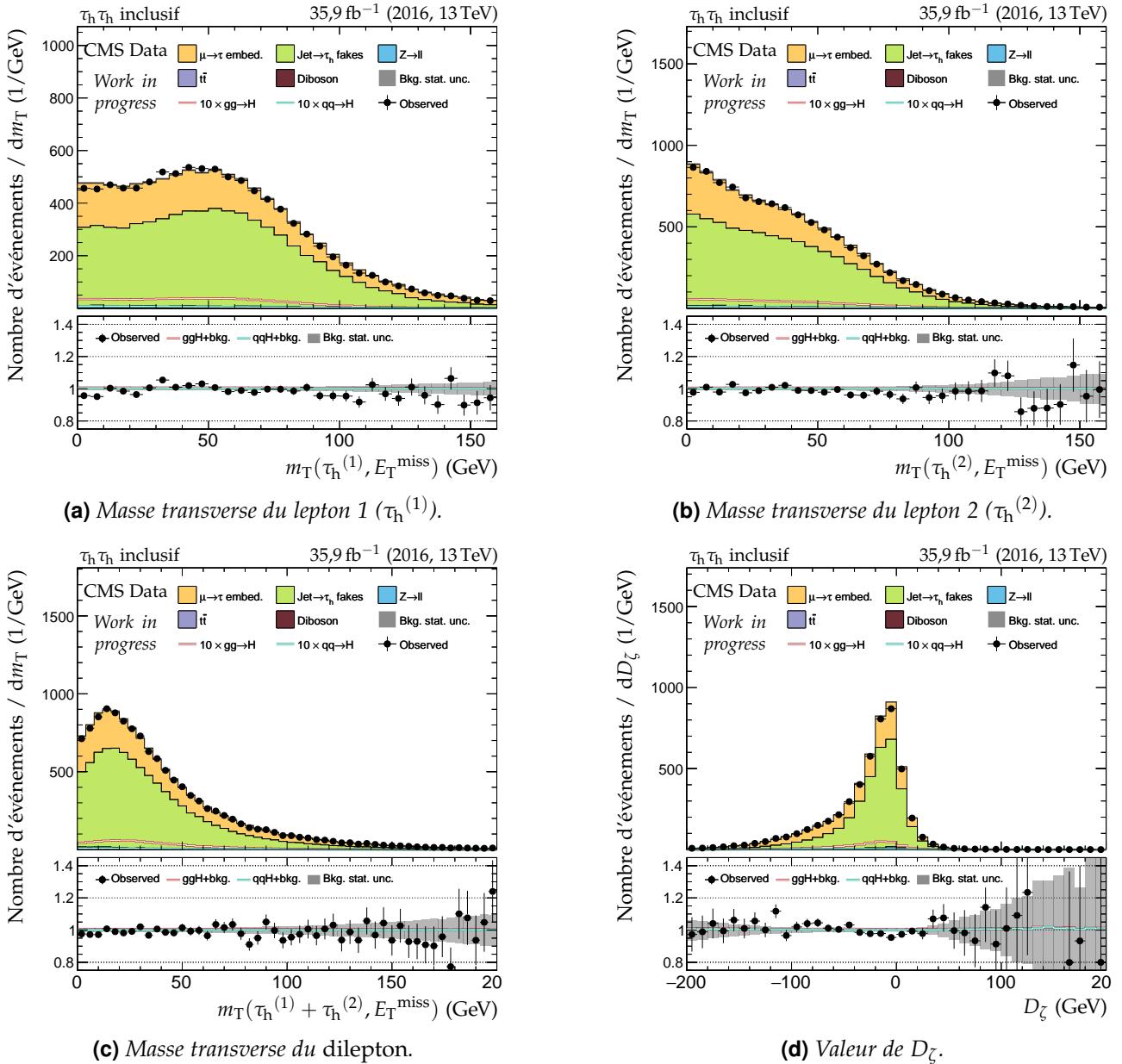
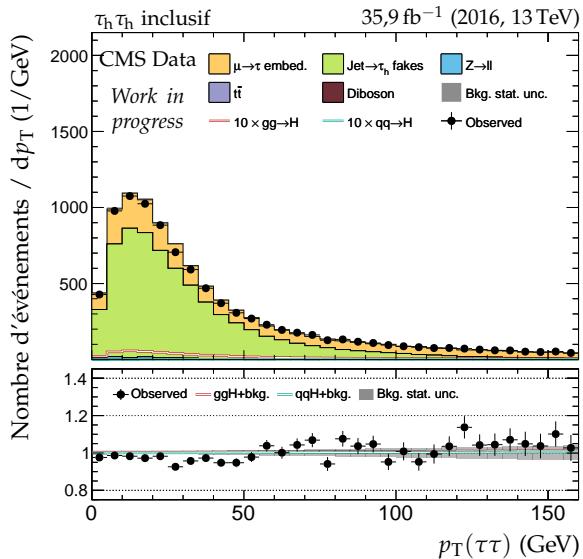
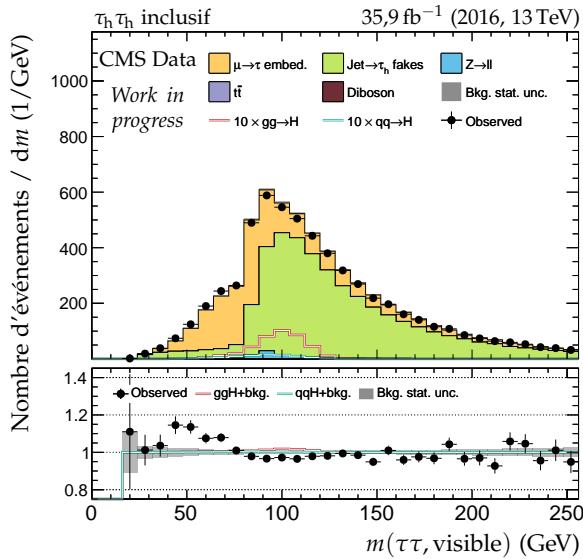


Figure X.4 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2016 : masses transverses et D_ζ .

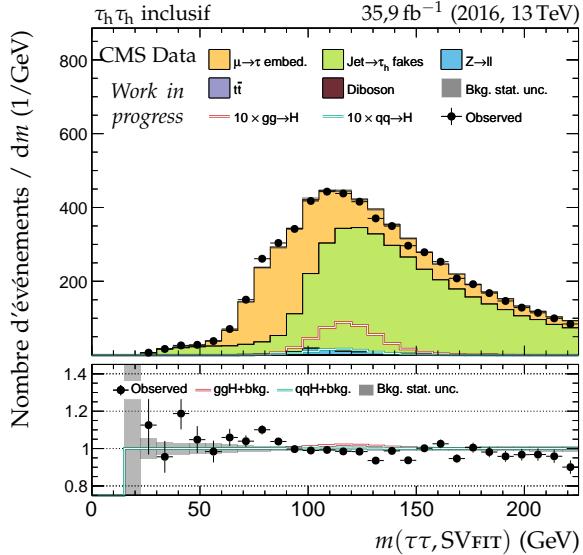
6 ANNEXE X. DISTRIBUTIONS DE CONTRÔLE – $H \rightarrow \tau\tau$



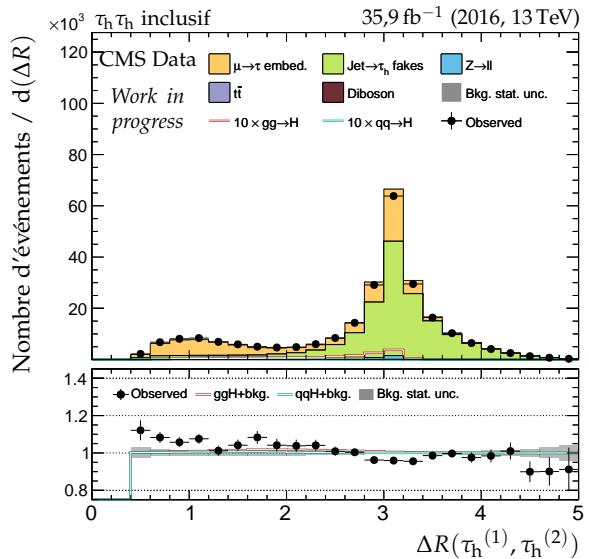
(a) Impulsion transverse du système di- τ .



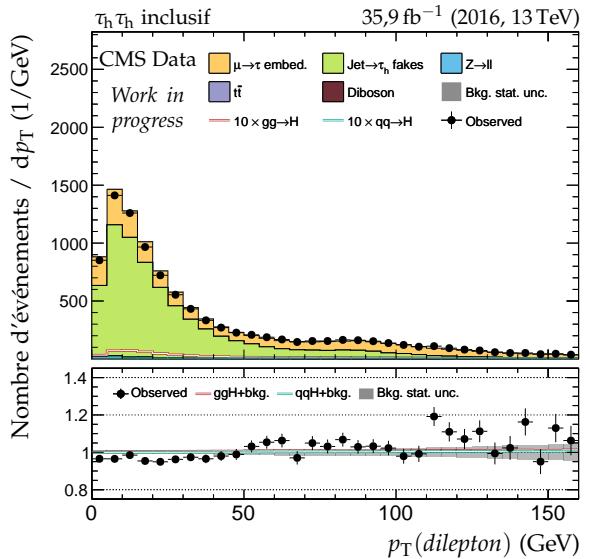
(c) Masse visible du système di- τ .



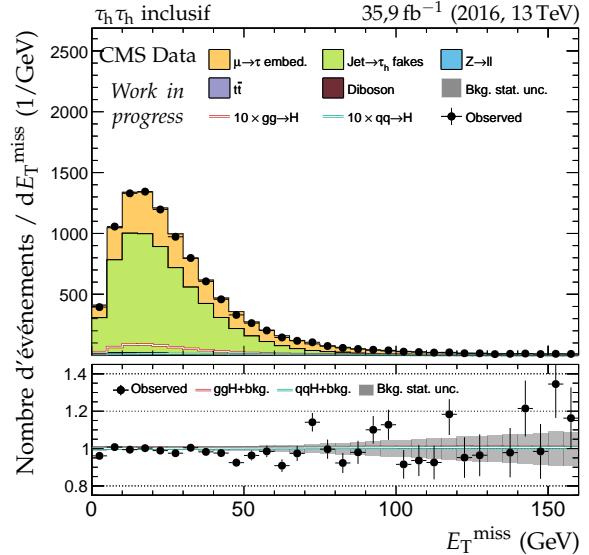
(e) Masse du système di- τ d'après SVFIT.



(b) Distance ΔR entre les leptons ($\tau_h^{(1)}$, $\tau_h^{(2)}$).

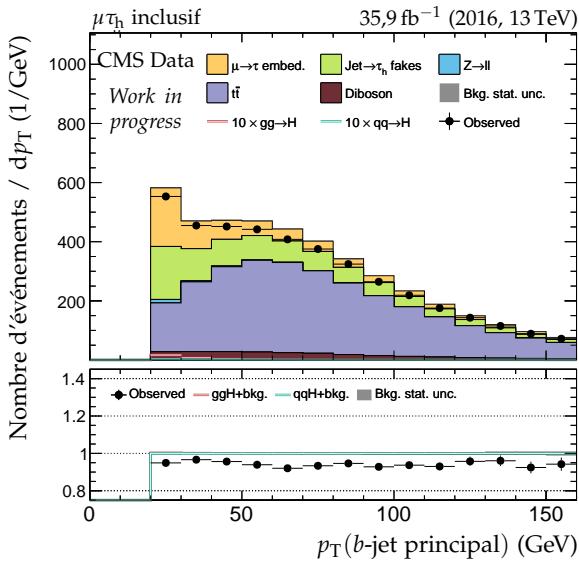


(d) Impulsion transverse du dilepton.

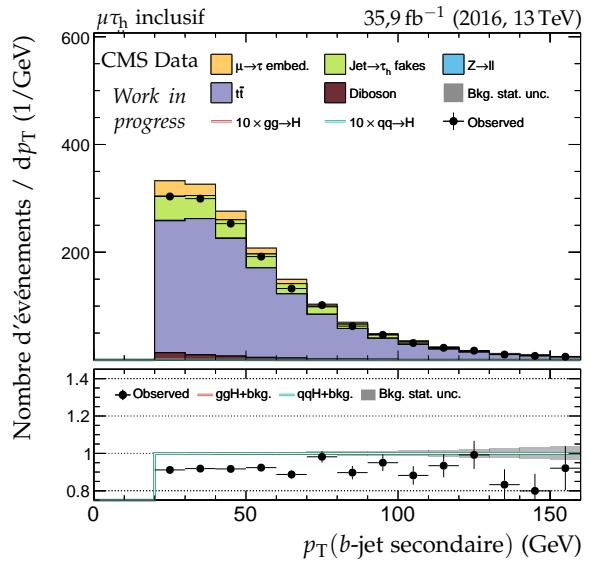


(f) Énergie transverse manquante.

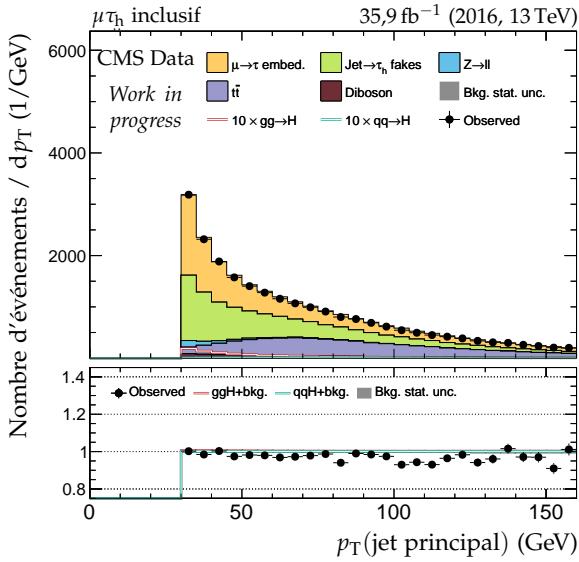
Figure X.5 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2016 : dilepton et énergie transverse manquante.



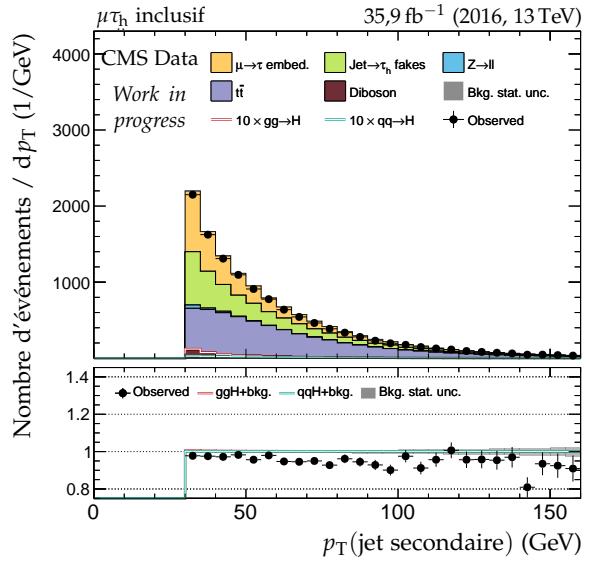
(a) Impulsion transverse du b-jet principal.



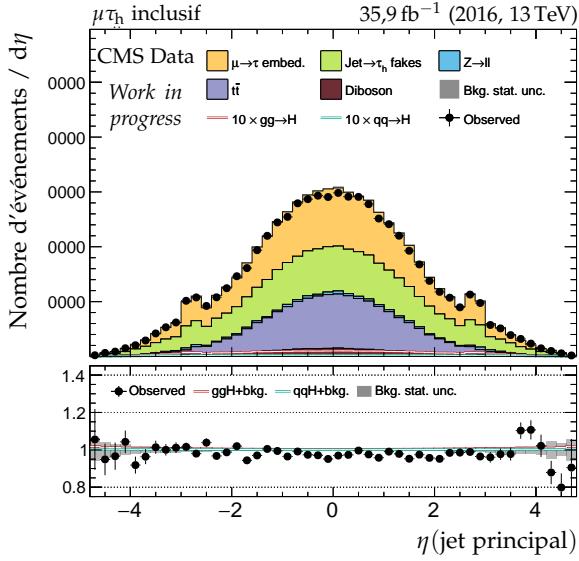
(b) Impulsion transverse du b-jet secondaire.



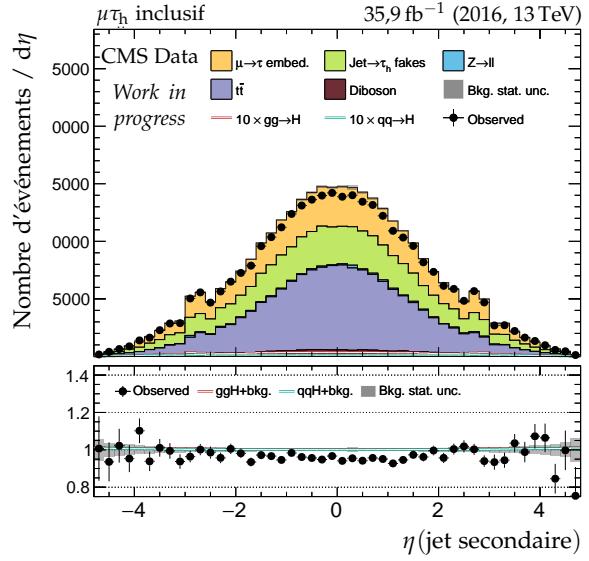
(c) Impulsion transverse du jet principal.



(d) Impulsion transverse du jet secondaire.



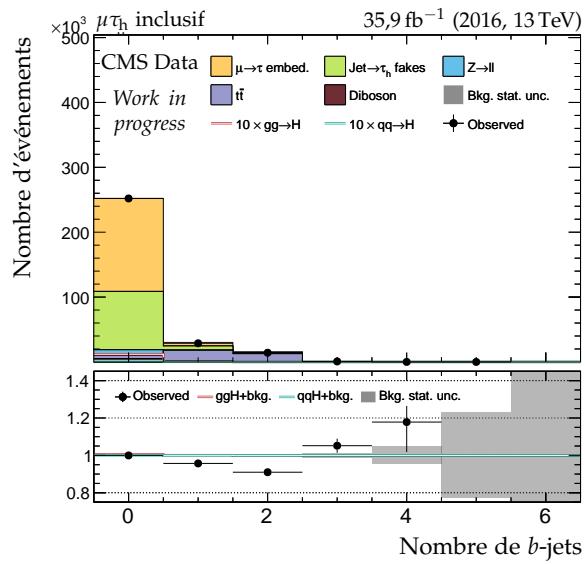
(e) Pseudo-rapidité du jet principal.



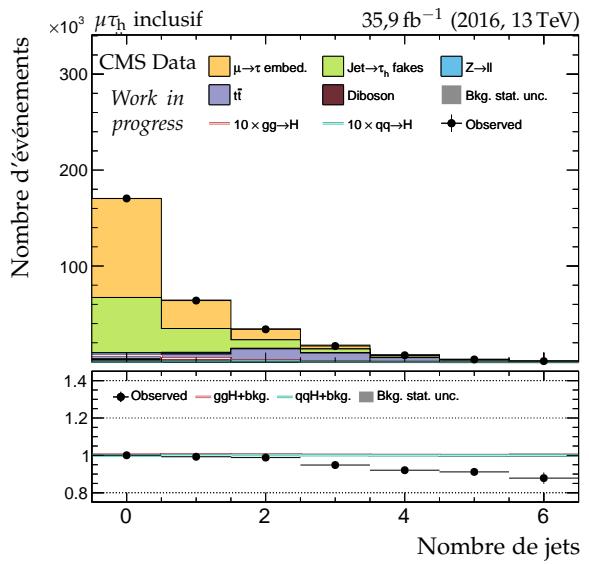
(f) Pseudo-rapidité du jet secondaire.

Figure X.6 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2016 : cinématique des jets.

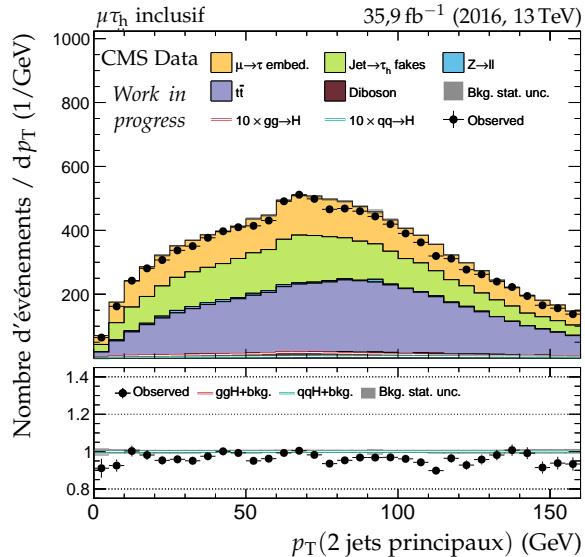
8 ANNEXE X. DISTRIBUTIONS DE CONTRÔLE – $H \rightarrow \tau\tau$



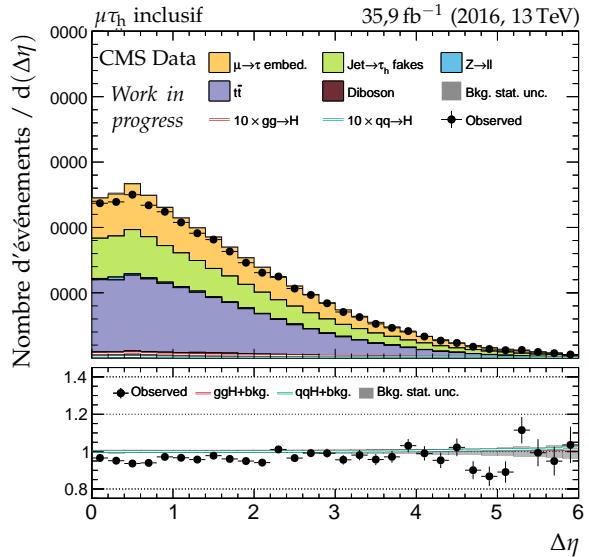
(a) Nombre de b-jets.



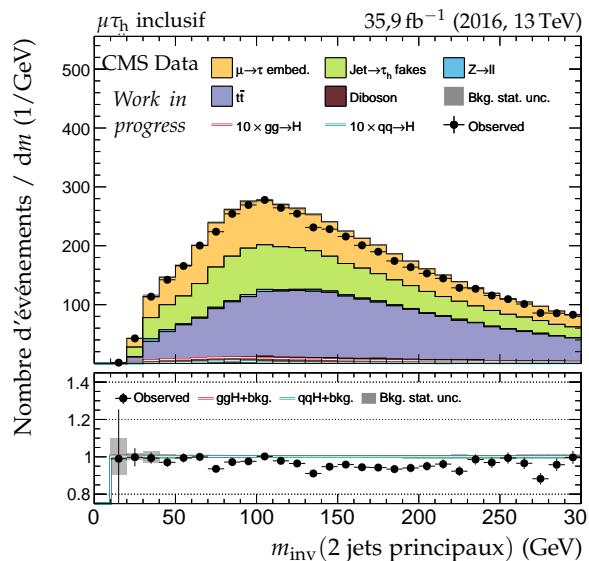
(b) Nombre de jets.



(c) Impulsion transverse du système des deux jets.



(d) Distance en η entre les deux jets.



(e) Masse invariante du système des deux jets.

Figure X.7 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2016 : nombre de jets et système des deux jets principaux.

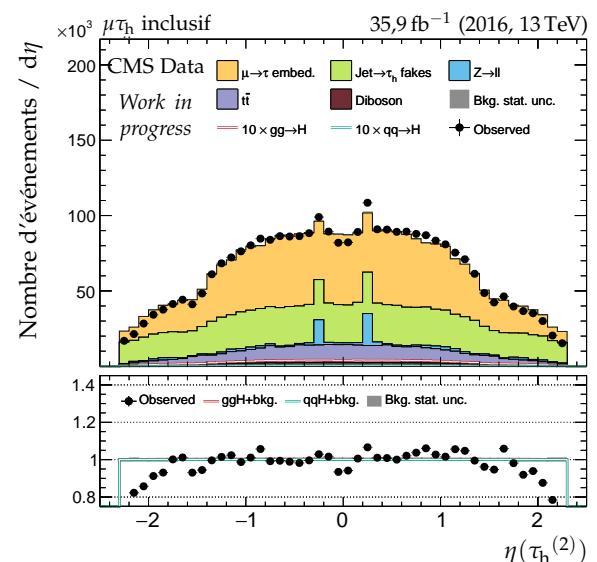
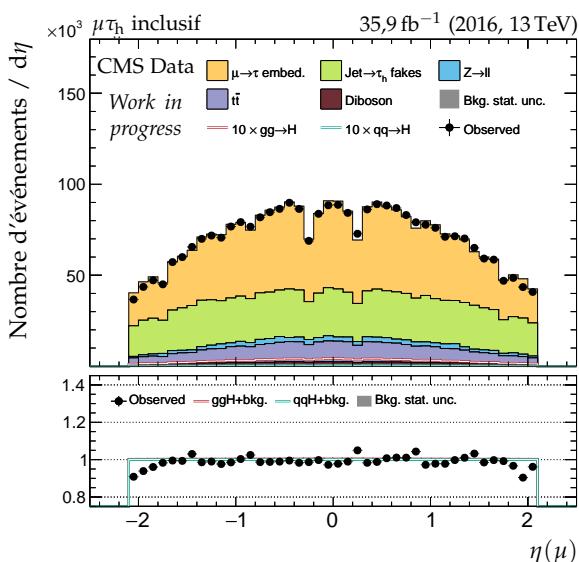
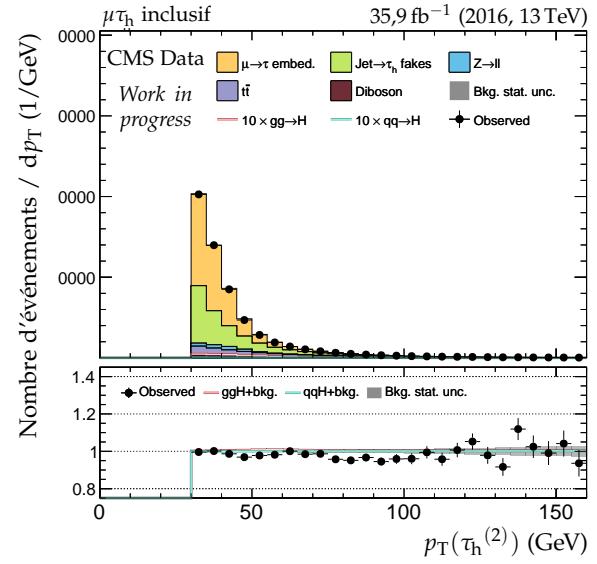
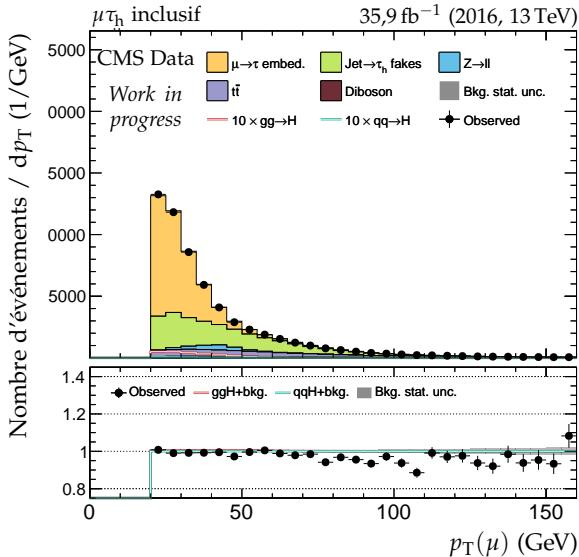


Figure X.8 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2016 : cinématique des leptons ($\mu, \tau_h^{(2)}$).

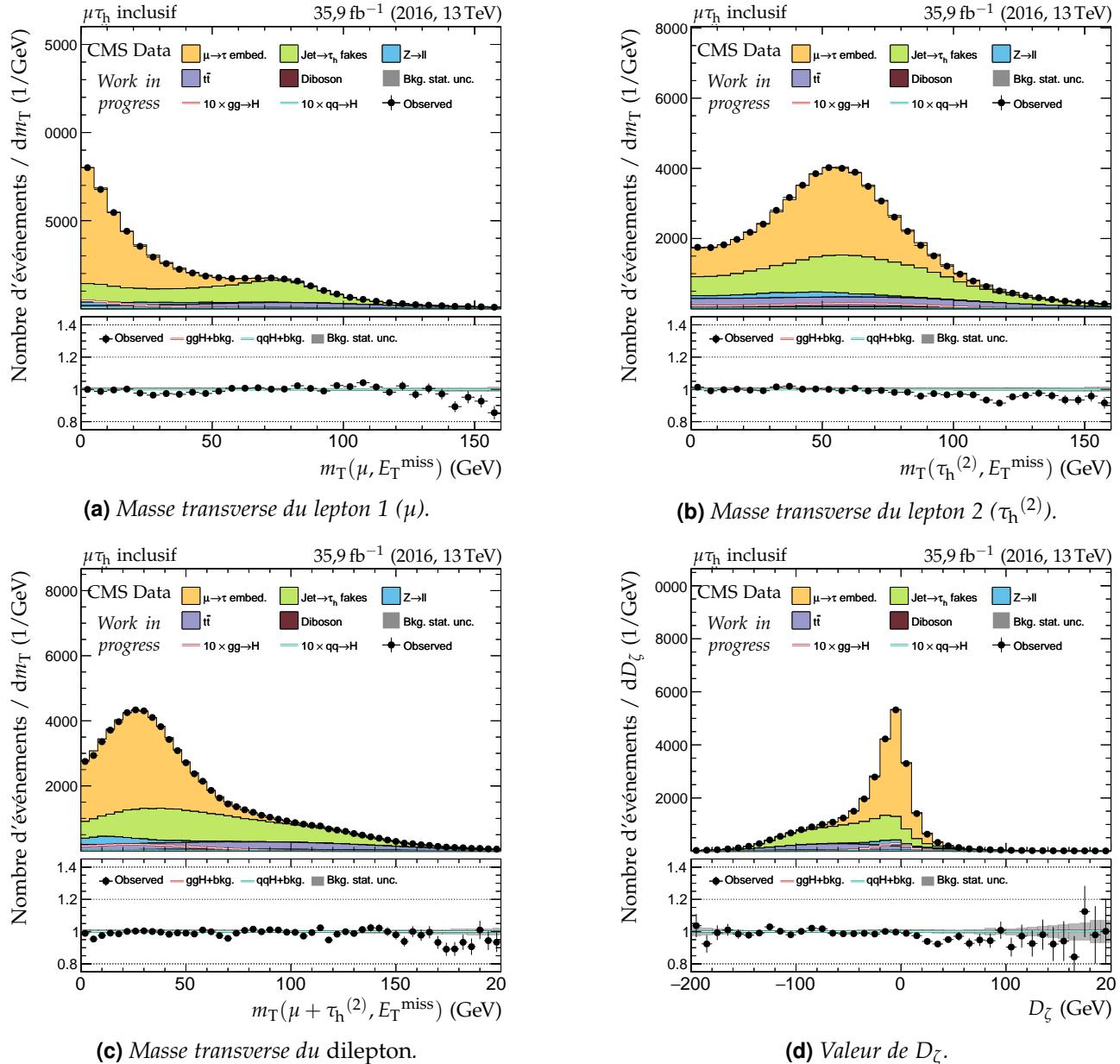
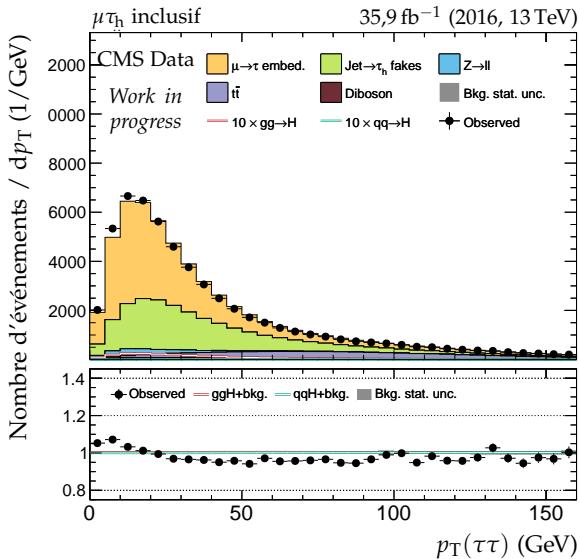
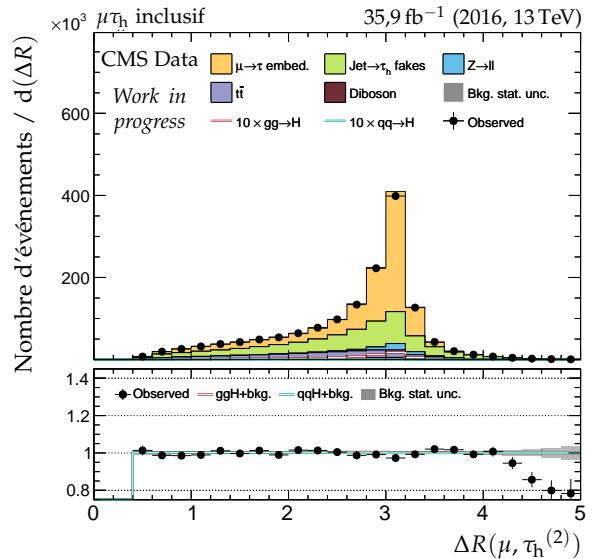
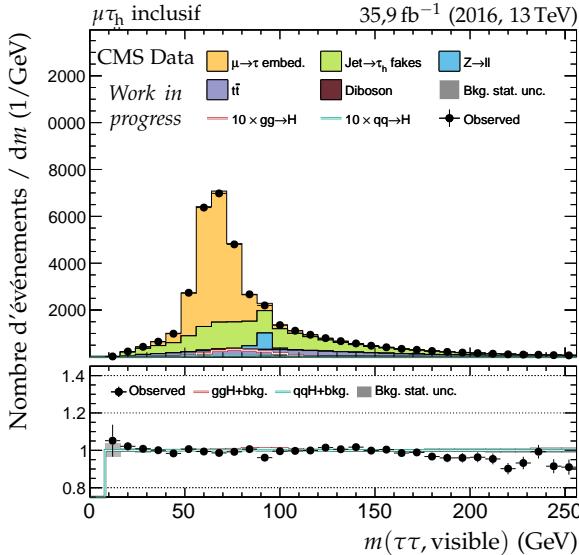
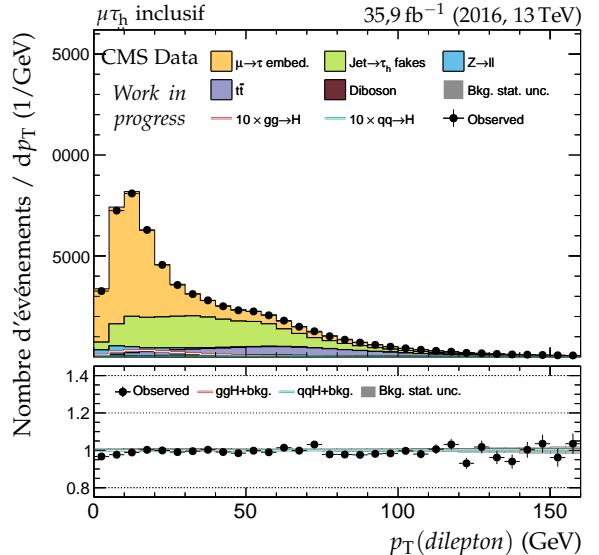
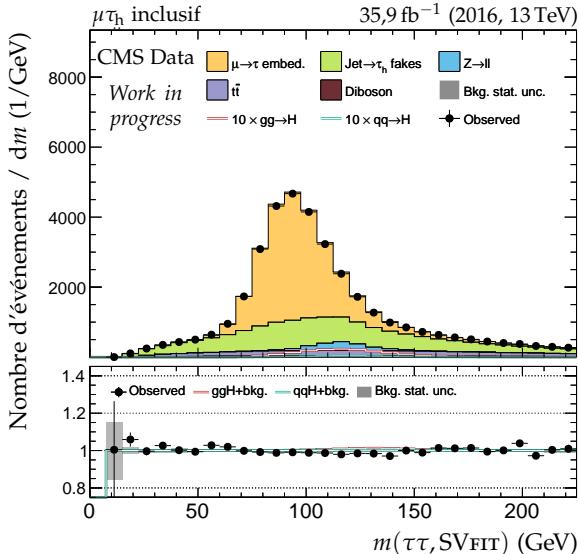
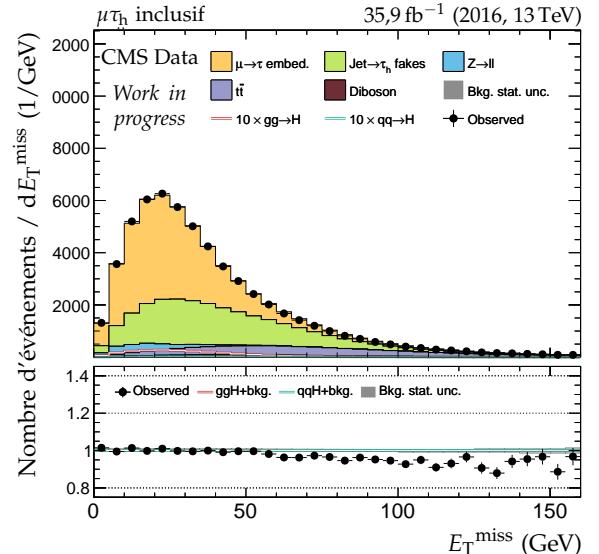


Figure X.9 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2016 : masses transverses et D_ζ .

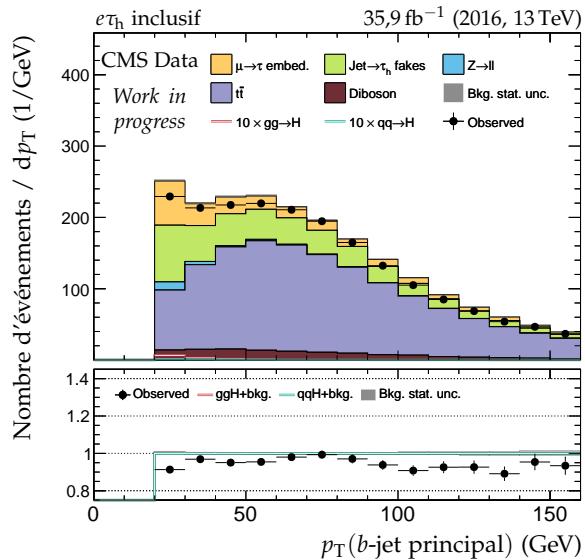
(a) Impulsion transverse du système di- τ .(b) Distance ΔR entre les leptons ($\mu, \tau_h^{(2)}$).(c) Masse visible du système di- τ .

(d) Impulsion transverse du dilepton.

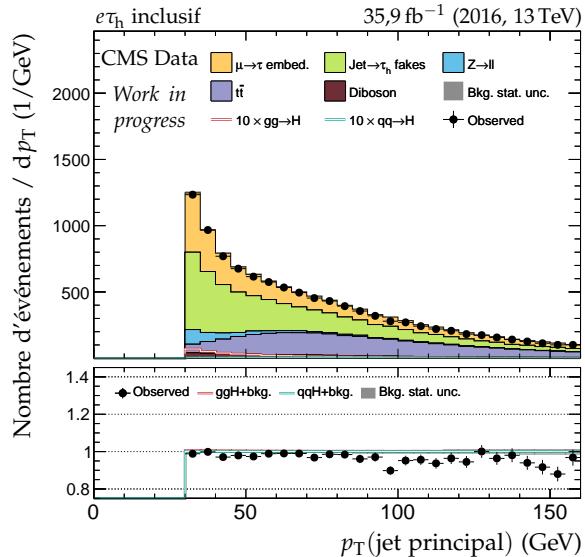
(e) Masse du système di- τ d'après SVFIT.

(f) Énergie transverse manquante.

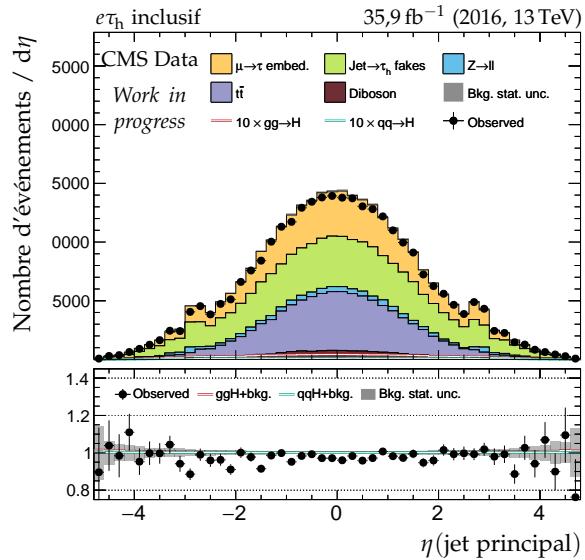
Figure X.10 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2016 : dilepton et énergie transverse manquante.



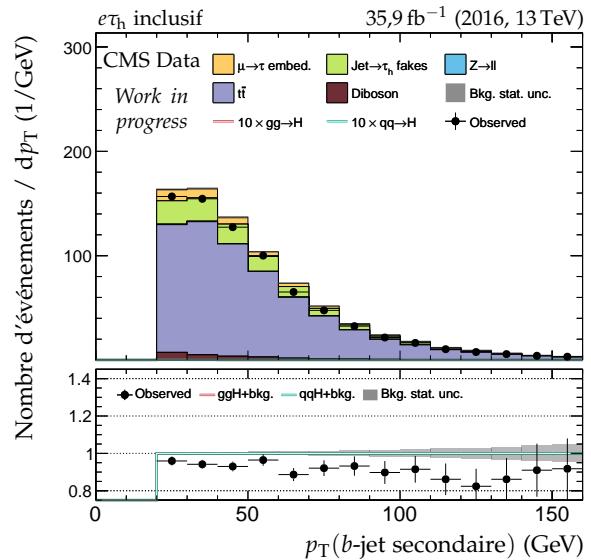
(a) Impulsion transverse du b-jet principal.



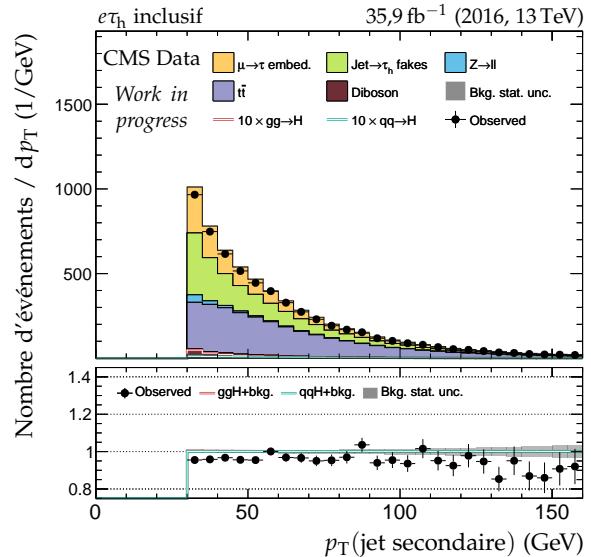
(c) Impulsion transverse du jet principal.



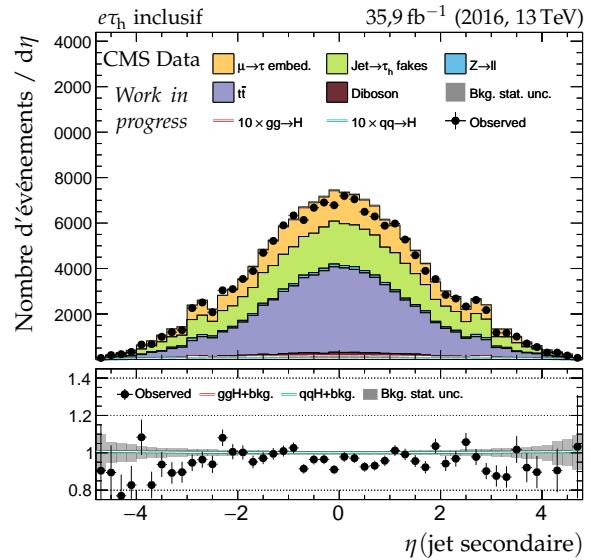
(e) Pseudo-rapidité du jet principal.



(b) Impulsion transverse du b-jet secondaire.



(d) Impulsion transverse du jet secondaire.



(f) Pseudo-rapidité du jet secondaire.

Figure X.11 – Distributions de contrôle pour le canal $e\tau_h$ en 2016 : cinématique des jets.

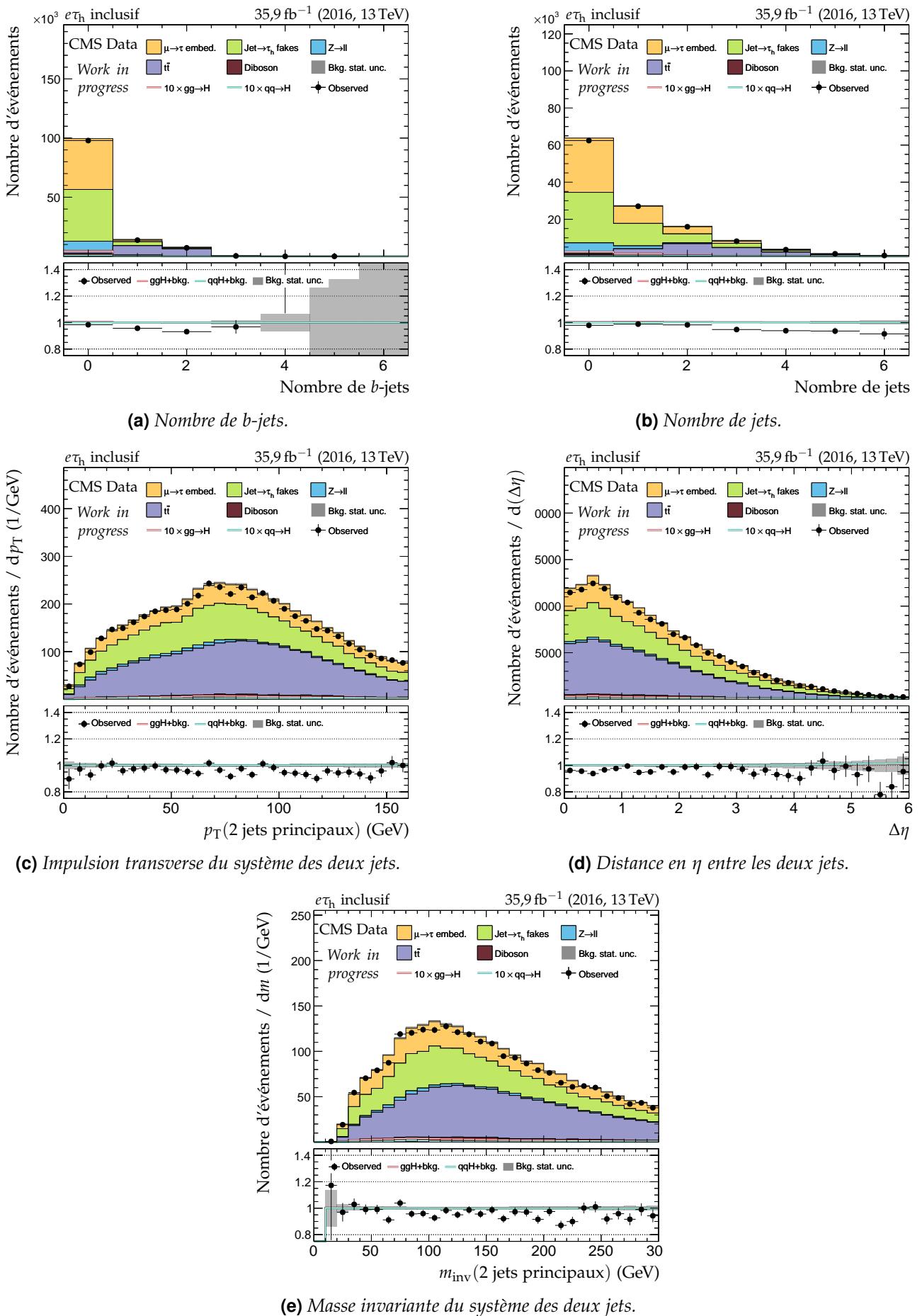


Figure X.12 – Distributions de contrôle pour le canal $e\tau_h$ en 2016 : nombre de jets et système des deux jets principaux.

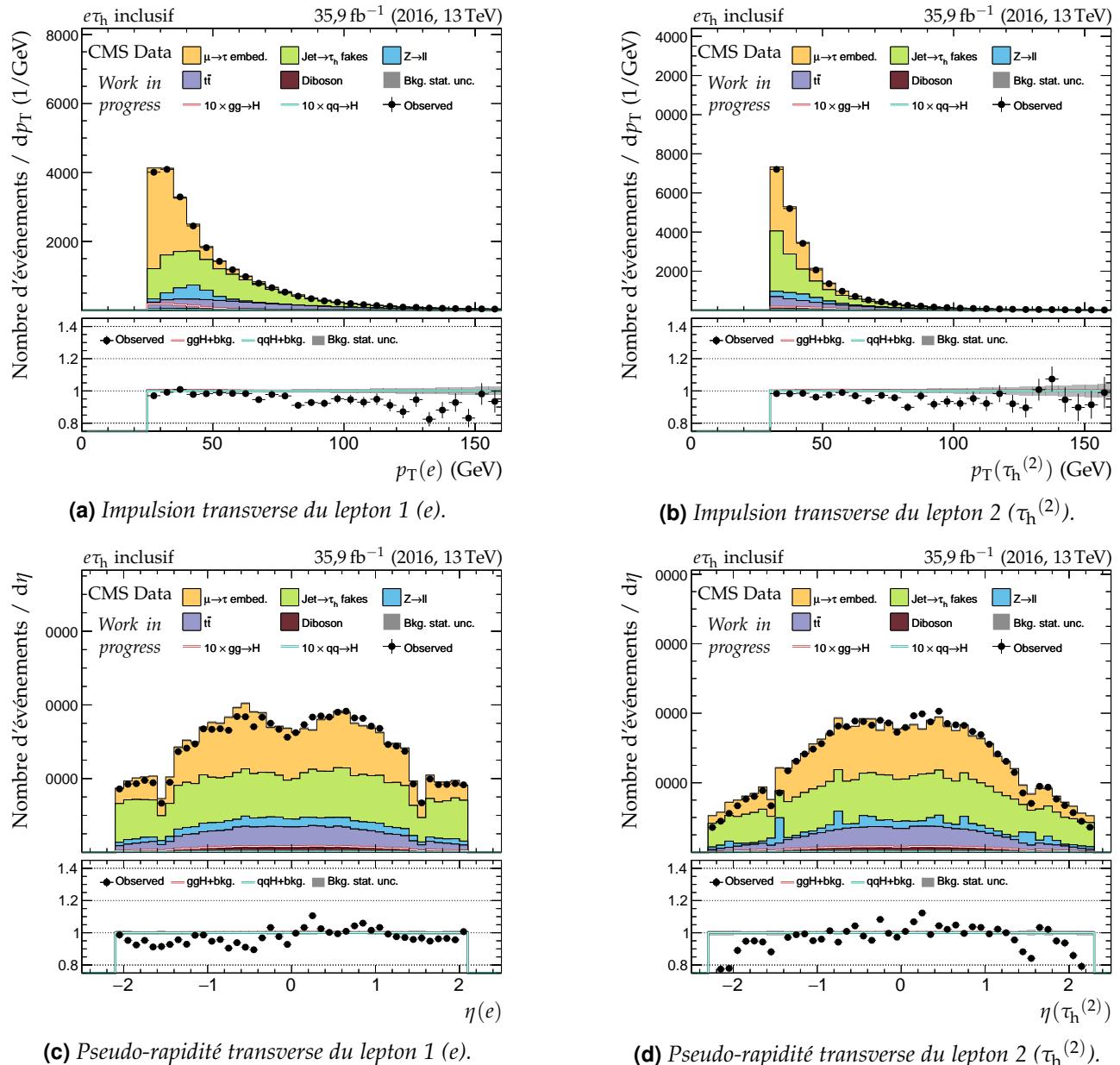


Figure X.13 – Distributions de contrôle pour le canal $e\tau_h$ en 2016 : cinématique des leptons ($e, \tau_h^{(2)}$).

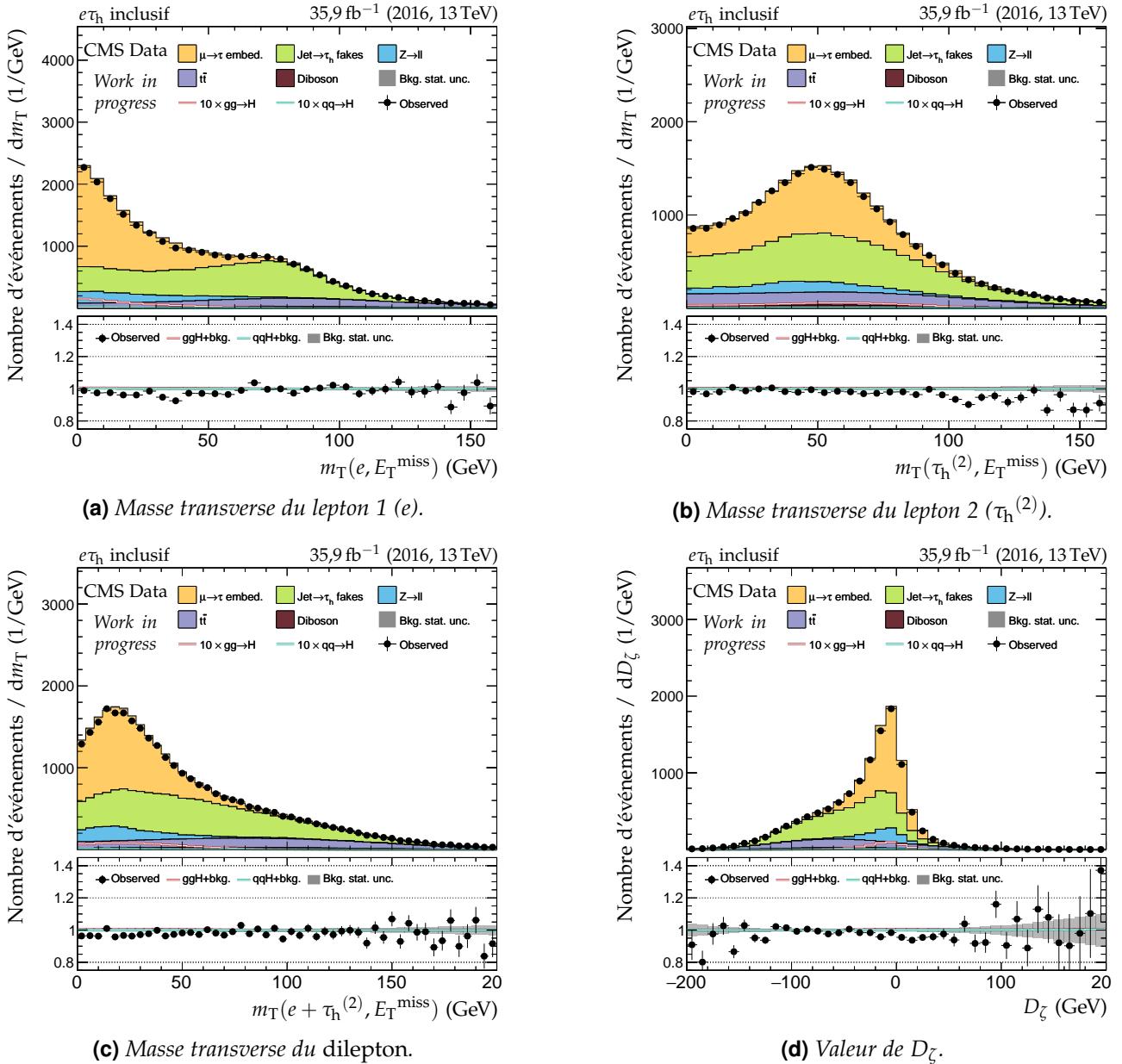
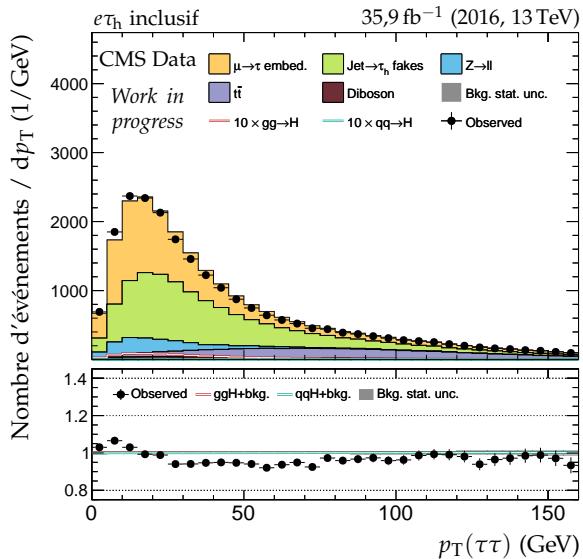
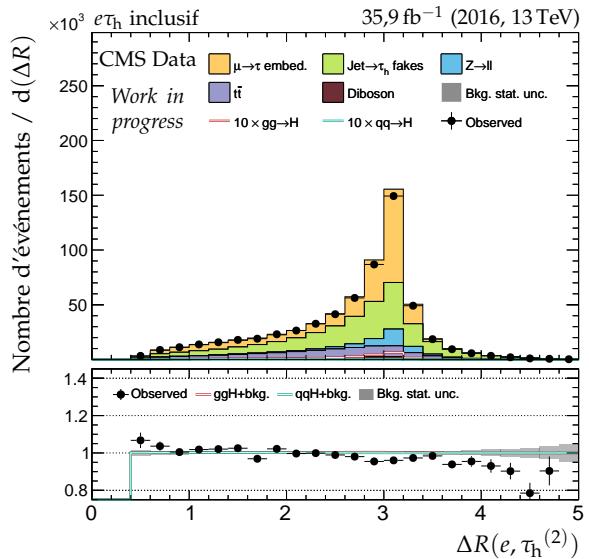


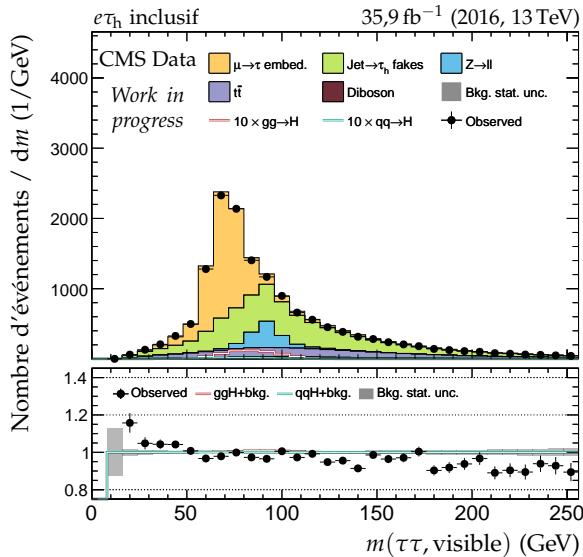
Figure X.14 – Distributions de contrôle pour le canal $e\tau_h$ en 2016 : masses transverses et D_ζ .



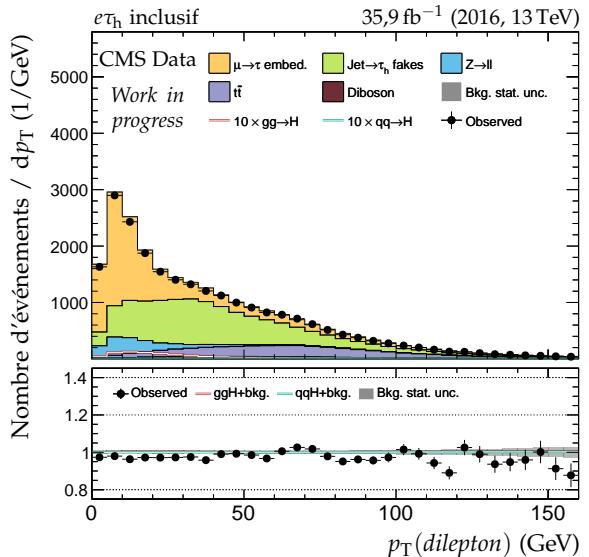
(a) Impulsion transverse du système di- τ .



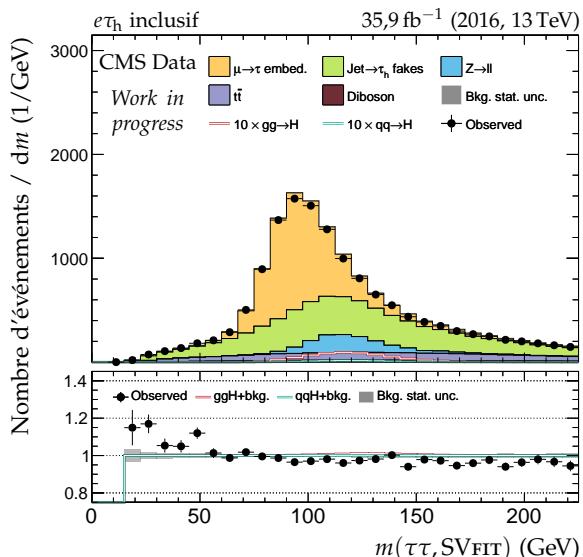
(b) Distance ΔR entre les leptons ($e, \tau_h^{(2)}$).



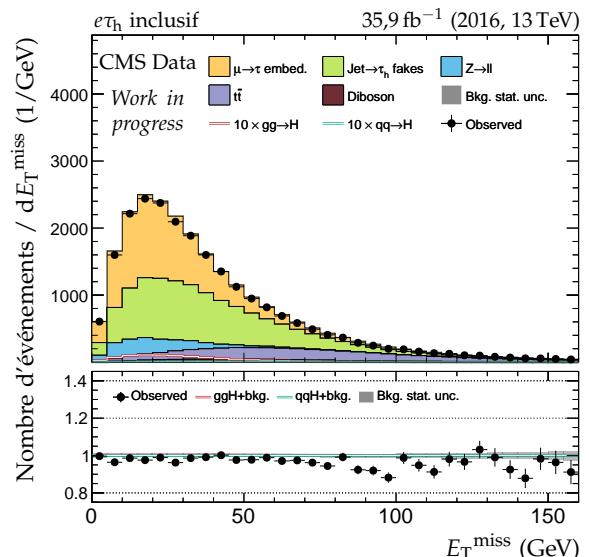
(c) Masse visible du système di- τ .



(d) Impulsion transverse du dilepton.



(e) Masse du système di- τ d'après SVFIT.



(f) Énergie transverse manquante.

Figure X.15 – Distributions de contrôle pour le canal $e\tau_h$ en 2016 : dilepton et énergie transverse manquante.

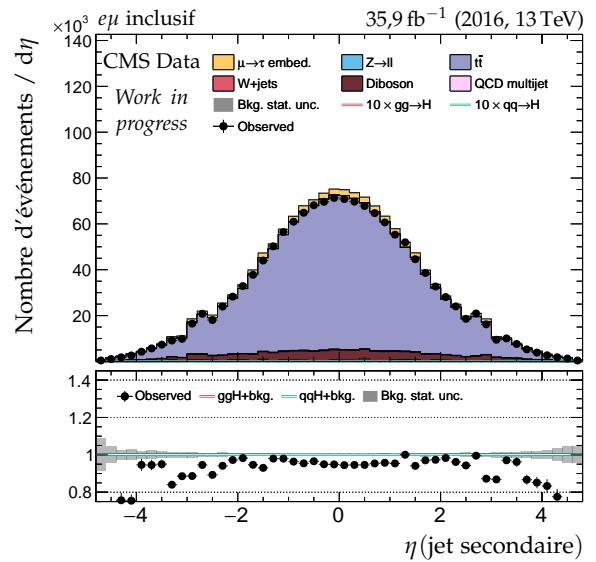
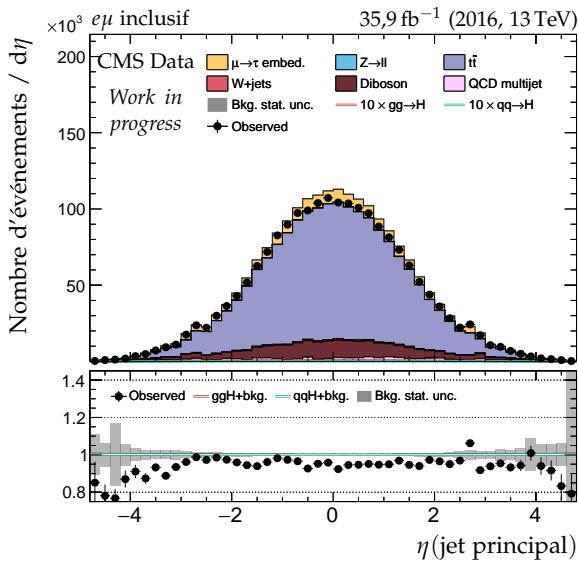
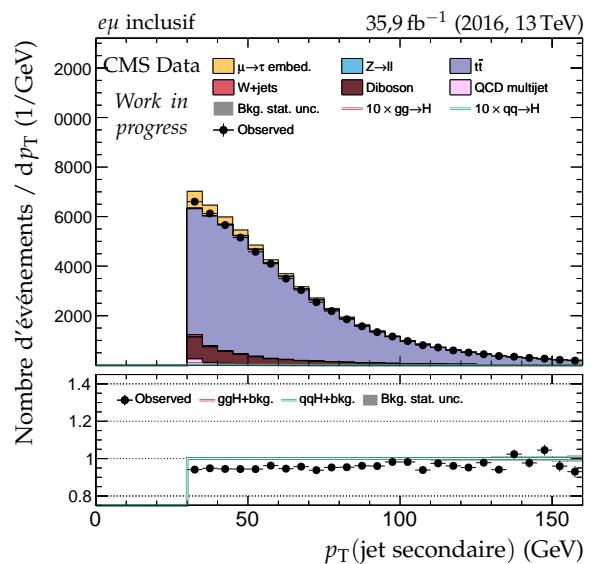
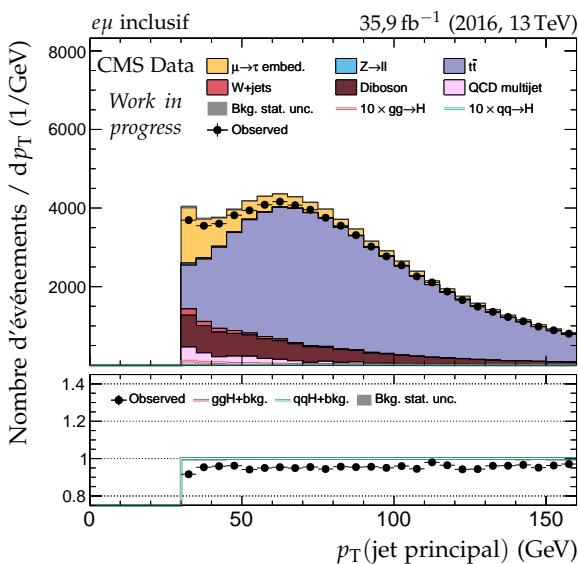
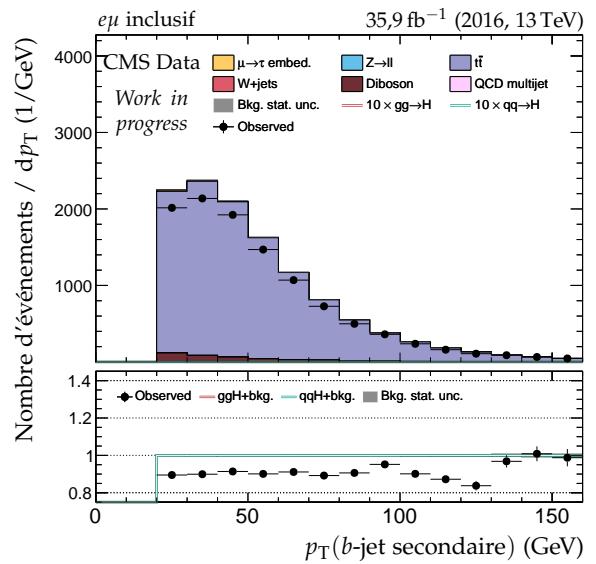
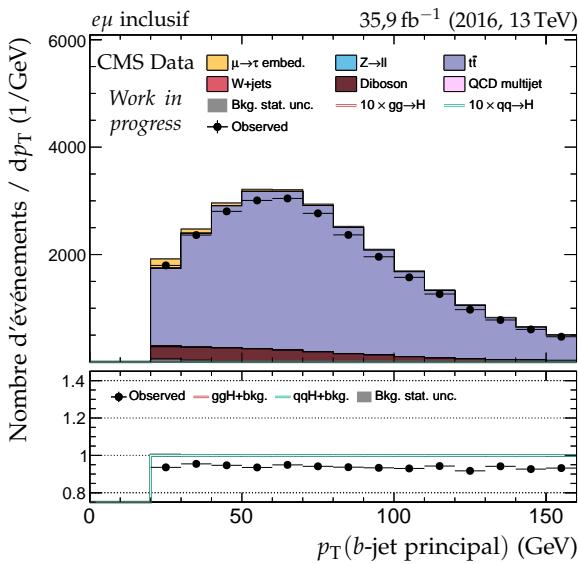
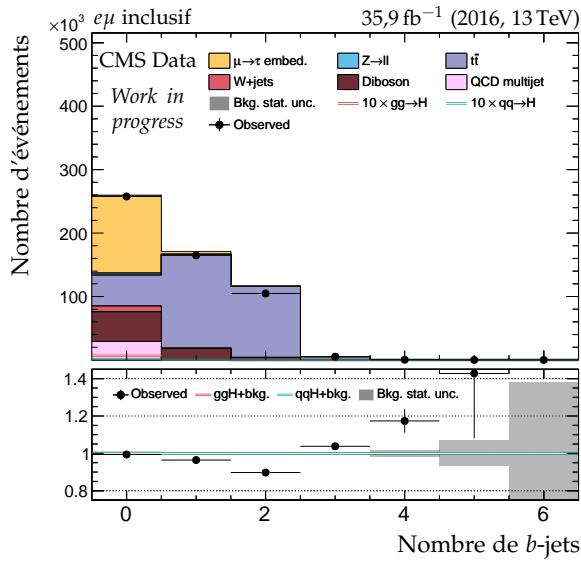
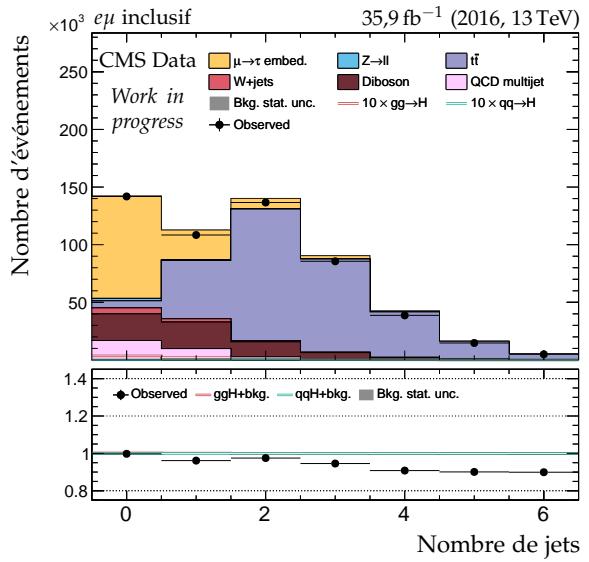


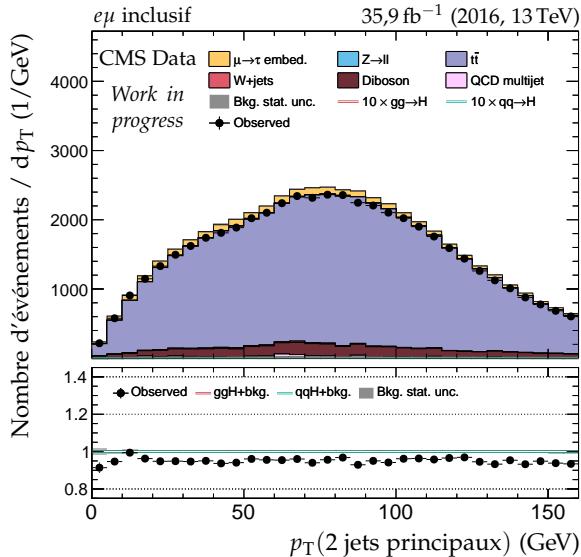
Figure X.16 – Distributions de contrôle pour le canal $e\mu$ en 2016 : cinématique des jets.



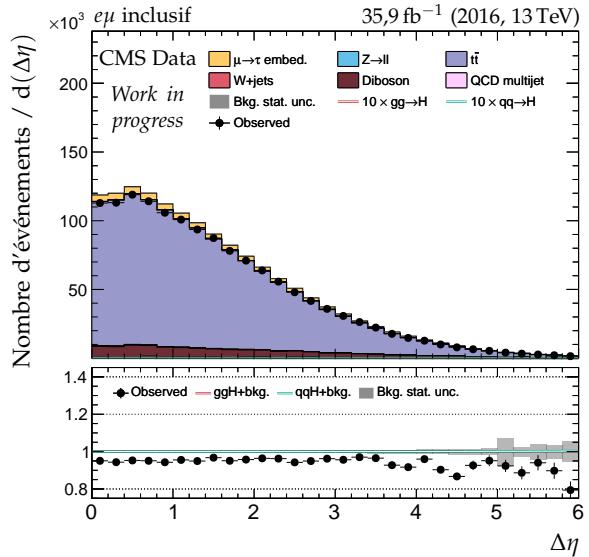
(a) Nombre de b -jets.



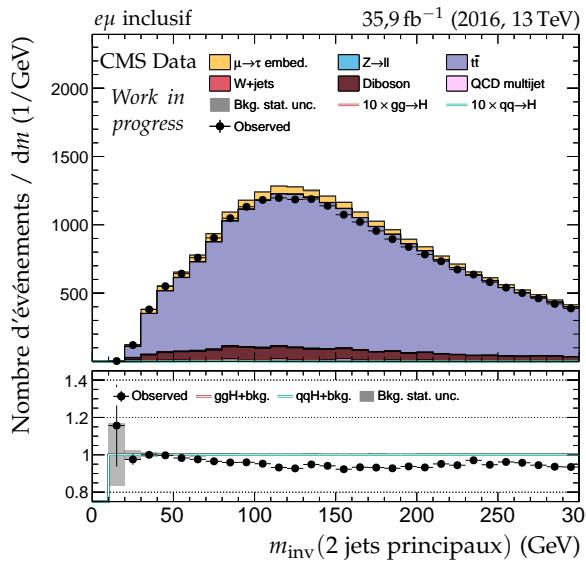
(b) Nombre de jets.



(c) Impulsion transverse du système des deux jets.



(d) Distance en η entre les deux jets.



(e) Masse invariante du système des deux jets.

Figure X.17 – Distributions de contrôle pour le canal $e\mu$ en 2016 : nombre de jets et système des deux jets principaux.

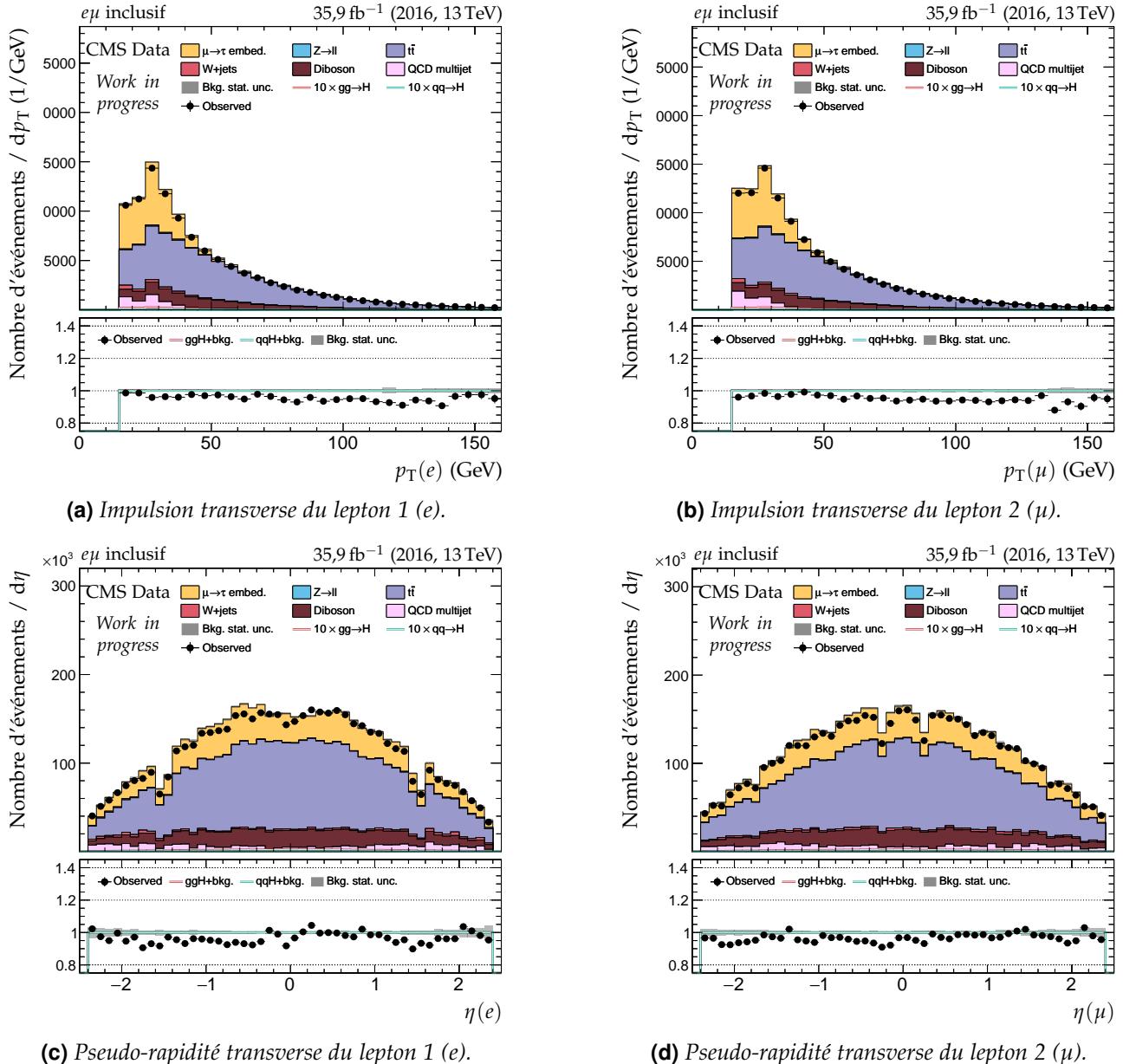


Figure X.18 – Distributions de contrôle pour le canal $e\mu$ en 2016 : cinématique des leptons (e, μ).

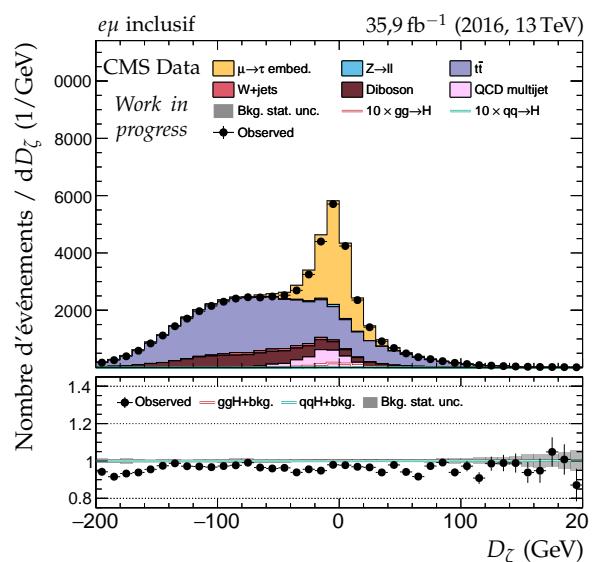
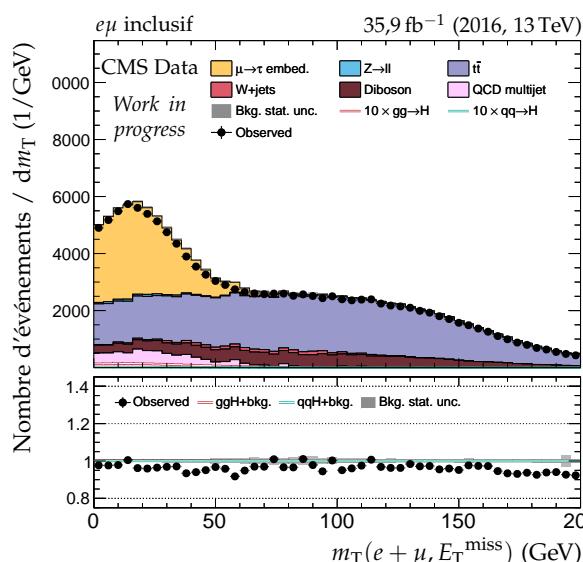
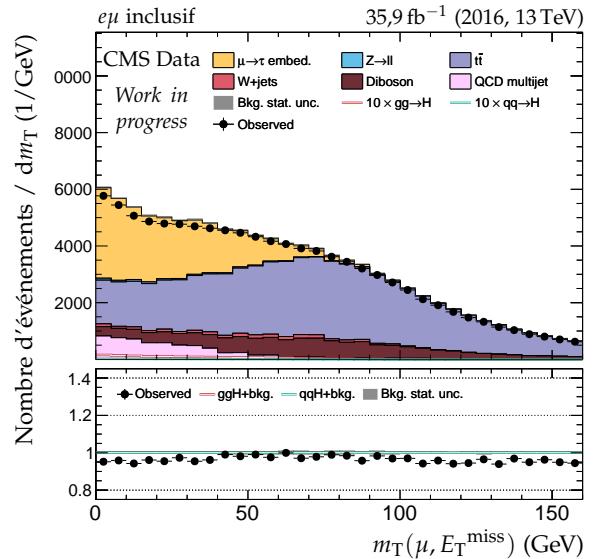
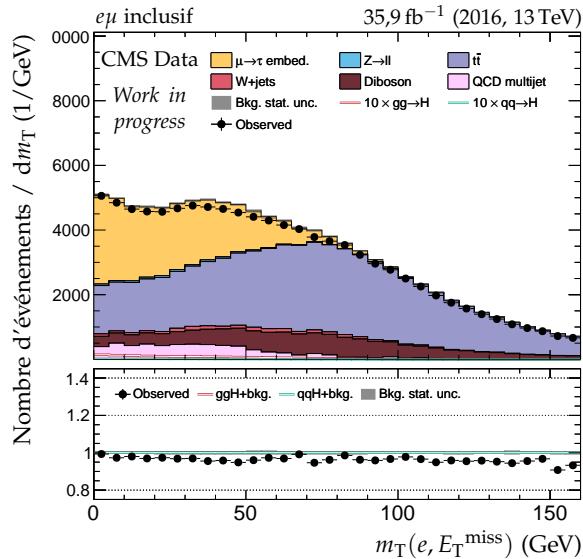
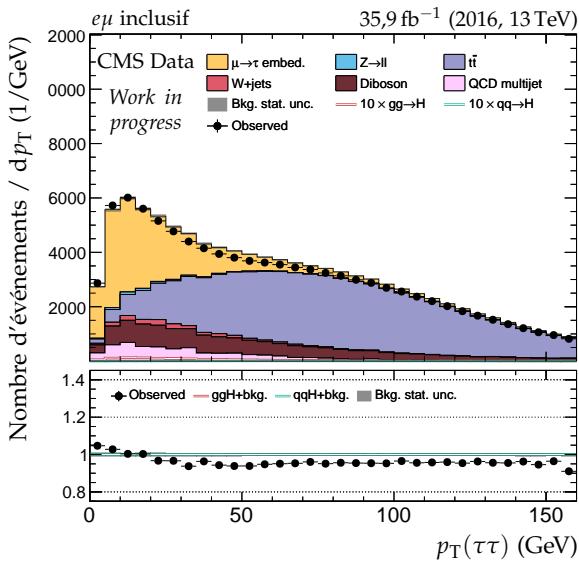
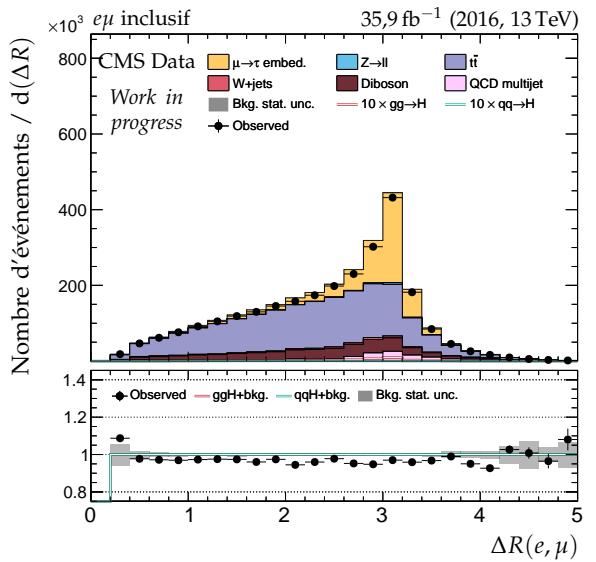
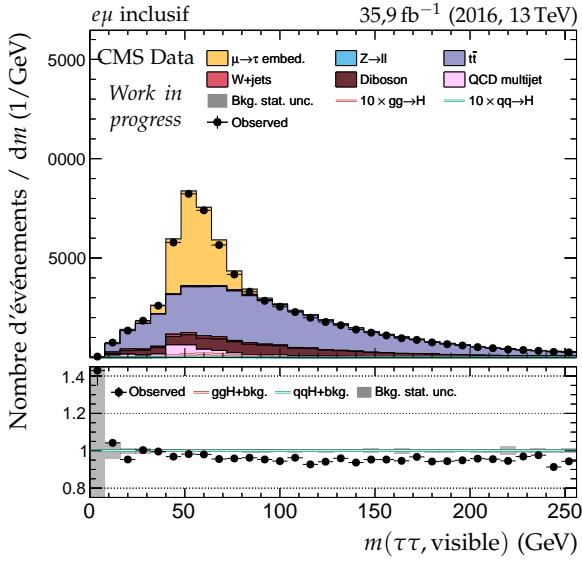
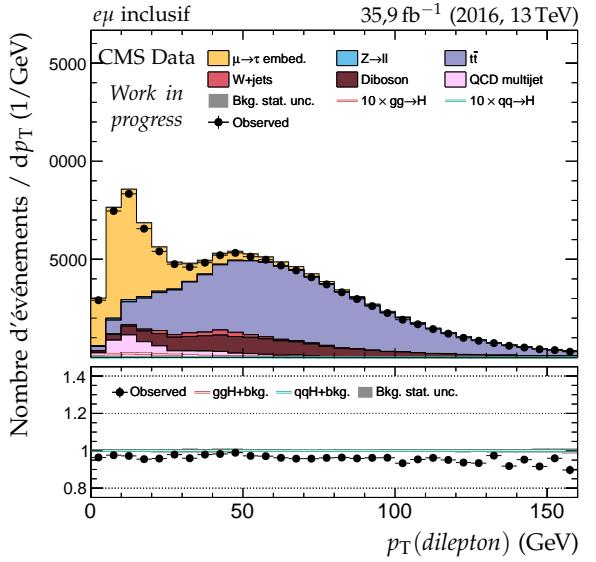
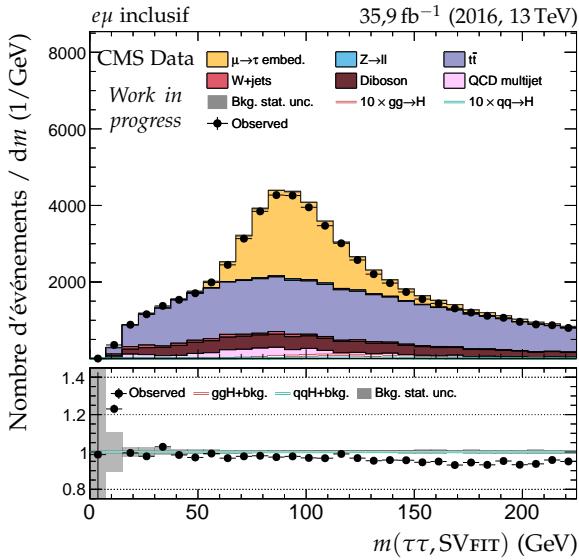
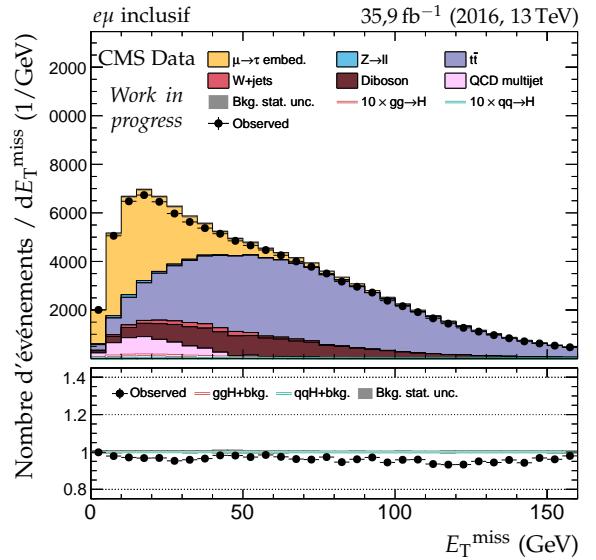


Figure X.19 – Distributions de contrôle pour le canal $e\mu$ en 2016 : masses transverses et D_ζ .

(a) Impulsion transverse du système di- τ .(b) Distance ΔR entre les leptons (e, μ).(c) Masse visible du système di- τ .

(d) Impulsion transverse du dilepton.

(e) Masse du système di- τ d'après SVFIT.

(f) Énergie transverse manquante.

Figure X.20 – Distributions de contrôle pour le canal $e\mu$ en 2016 : dilepton et énergie transverse manquante.

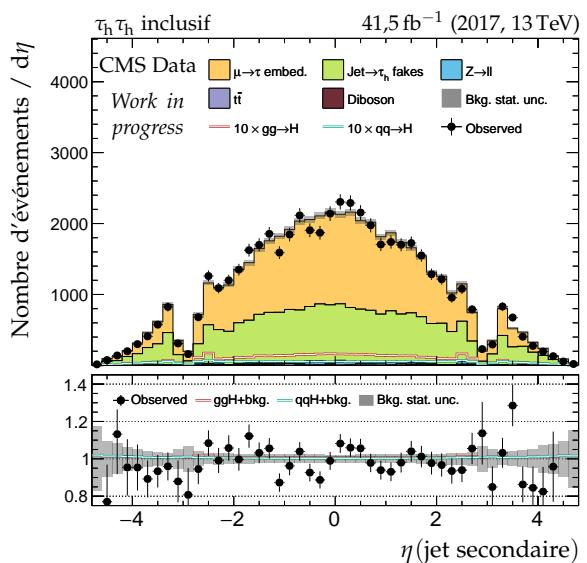
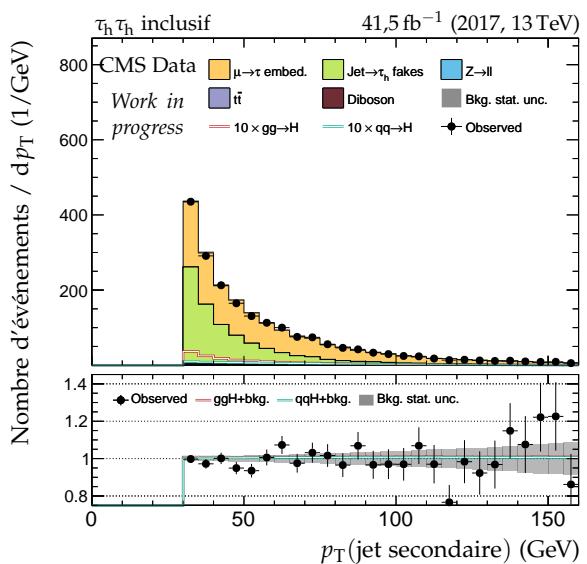
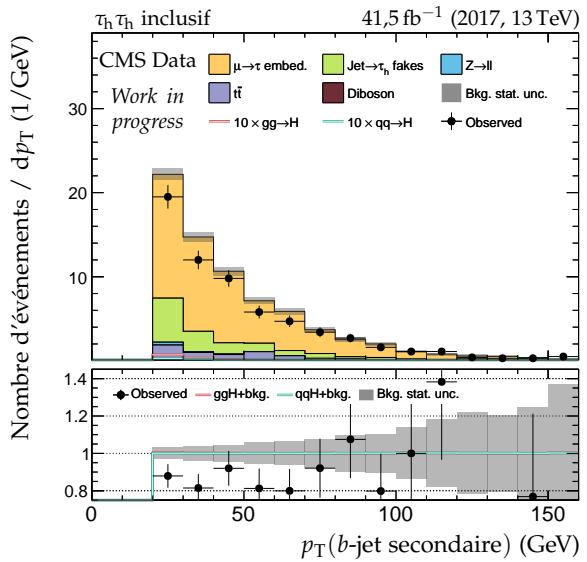
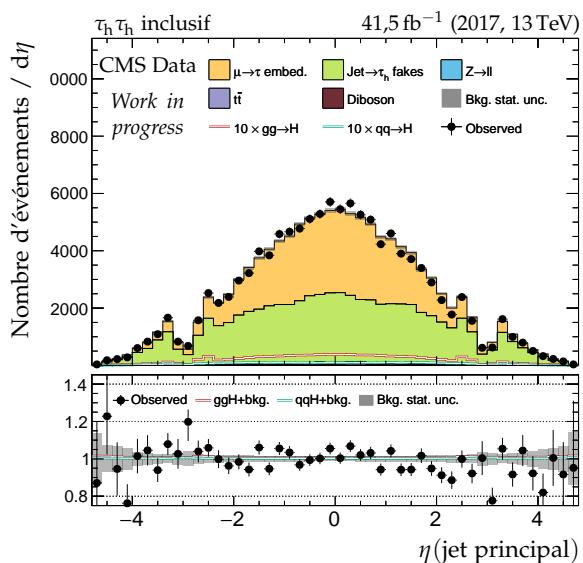
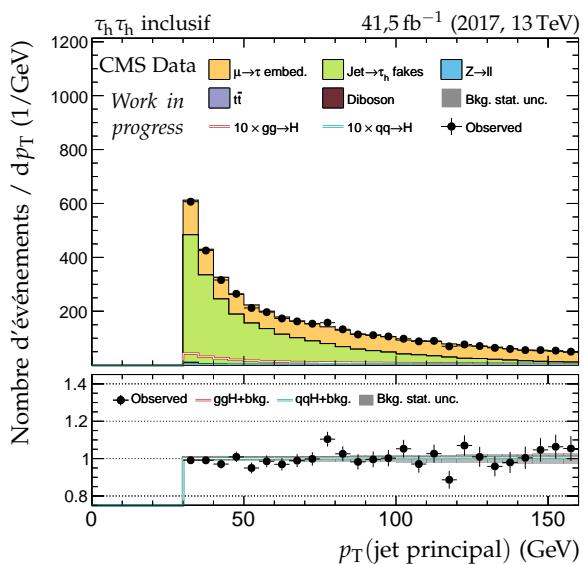
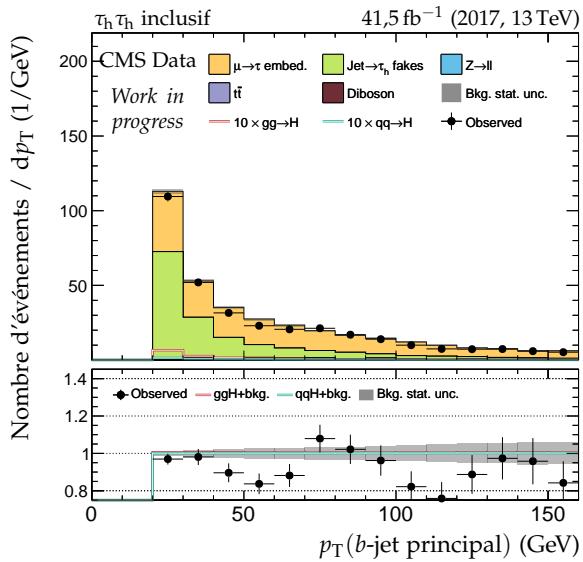


Figure X.21 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2017 : cinématique des jets.

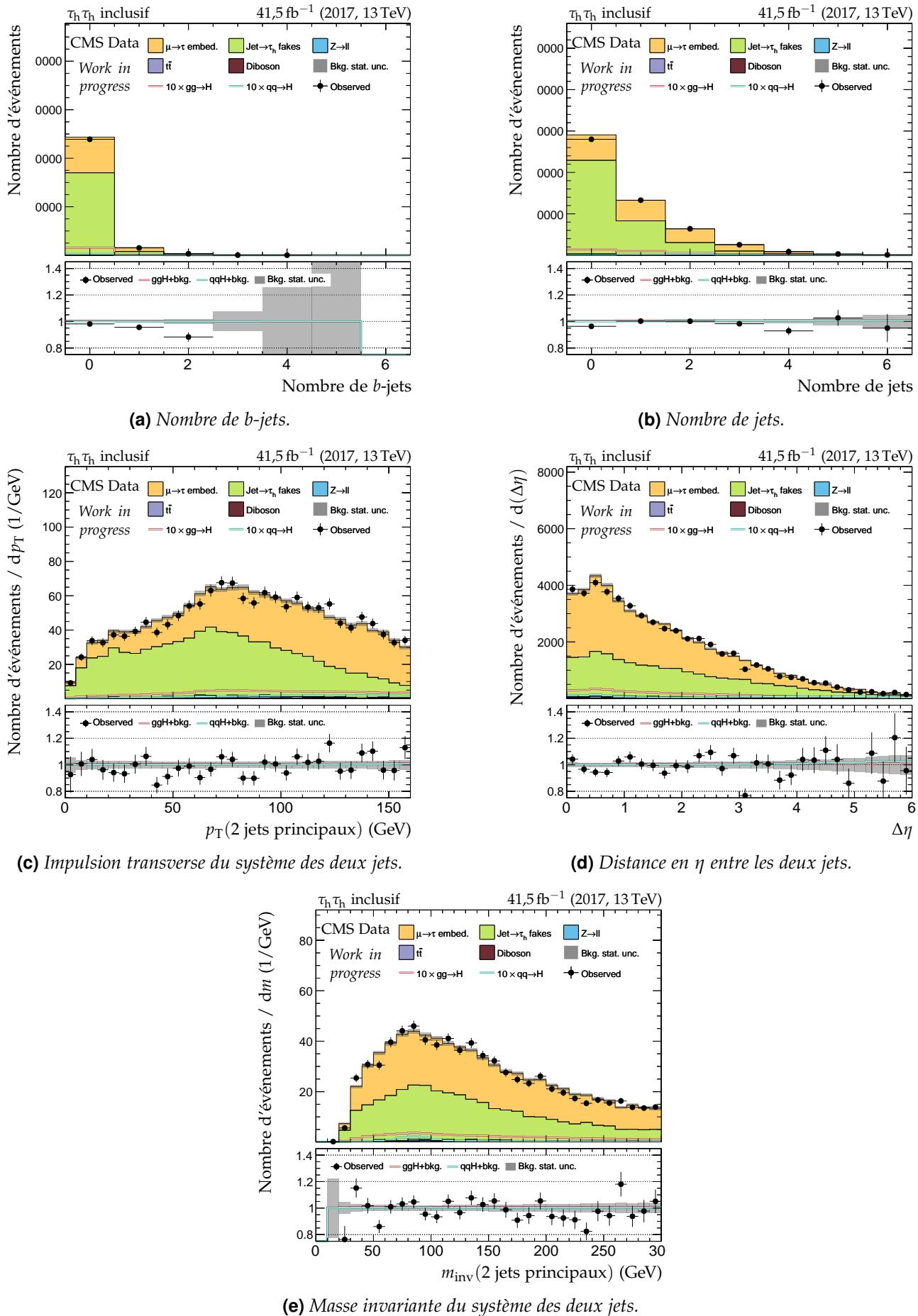


Figure X.22 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2017 : nombre de jets et système des deux jets principaux.

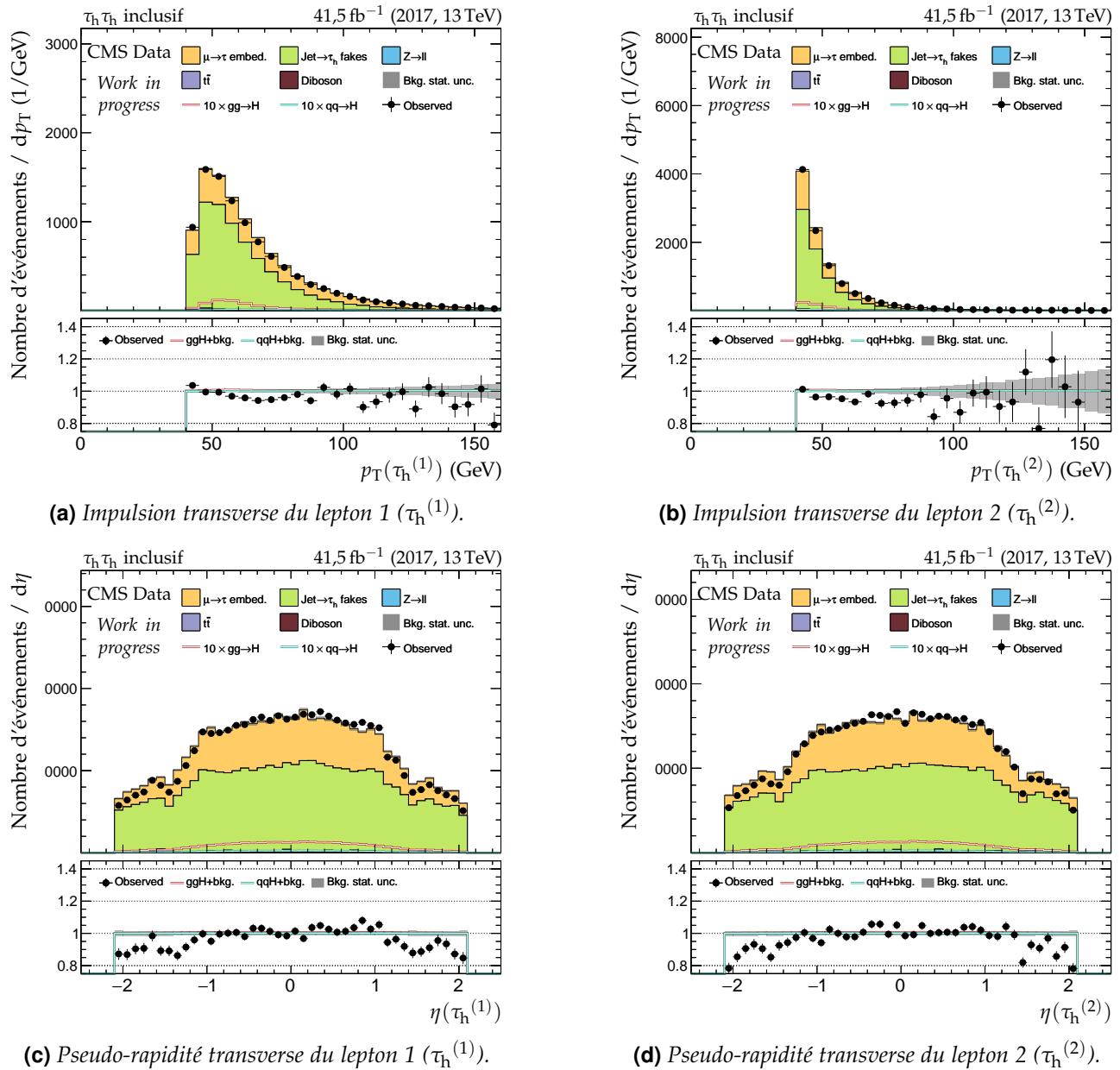


Figure X.23 – Distributions de contrôle pour le canal $\tau_h\tau_h$ en 2017 : cinématique des leptons ($\tau_h^{(1)}, \tau_h^{(2)}$).

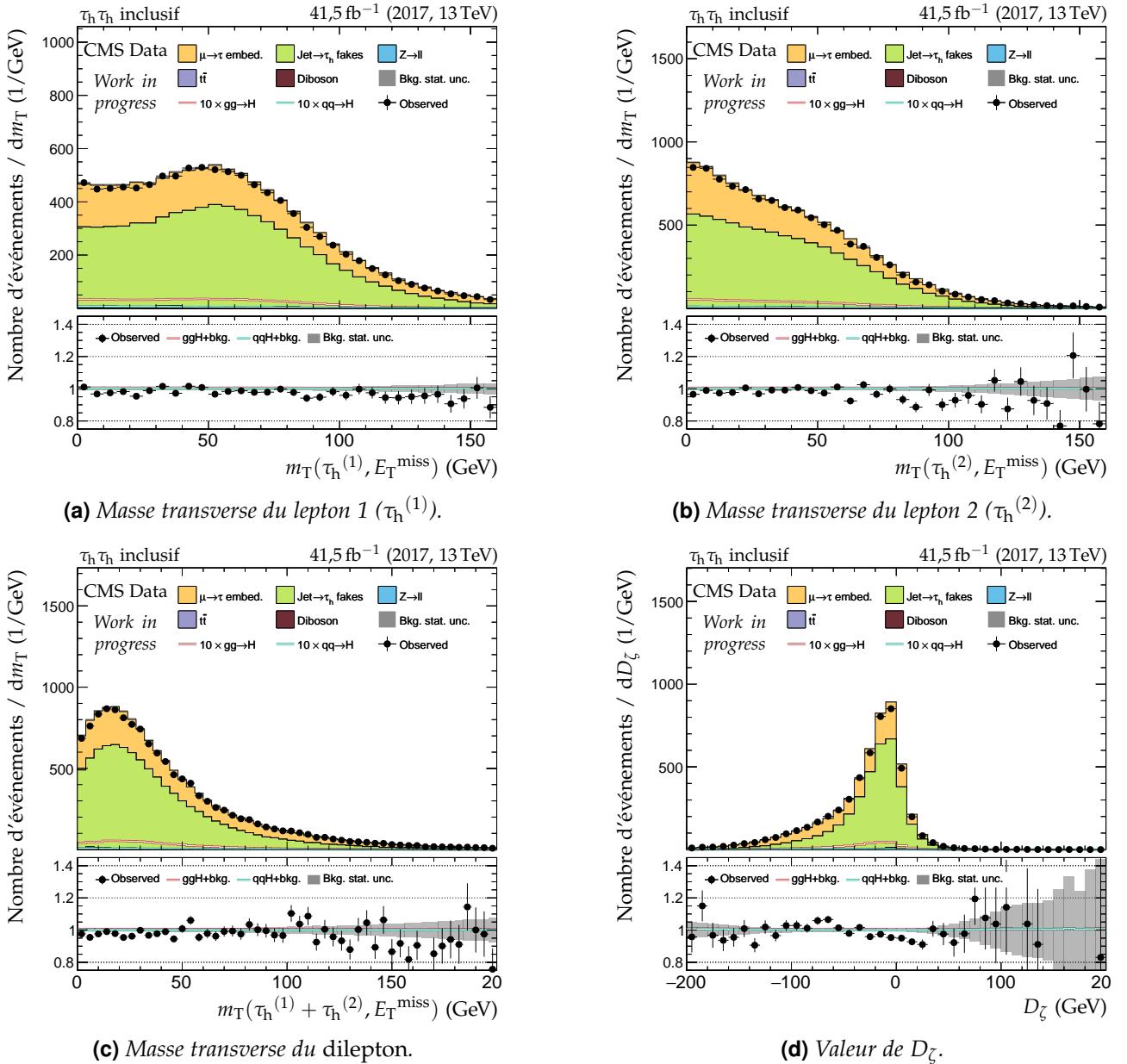
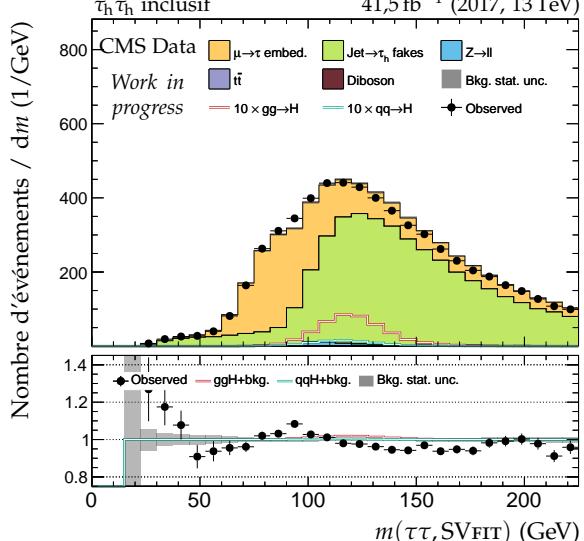
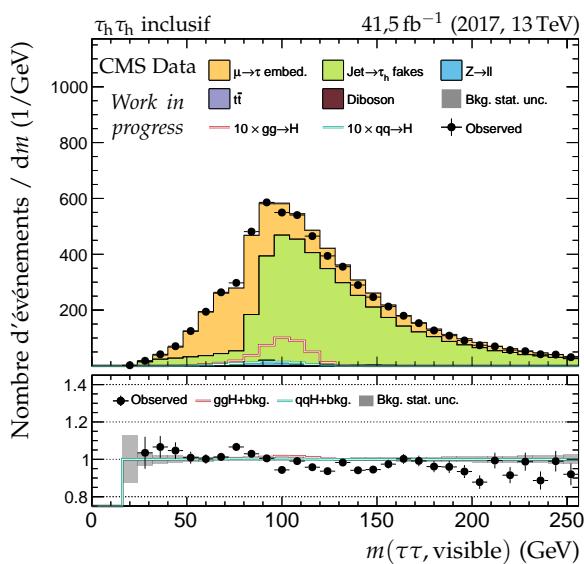
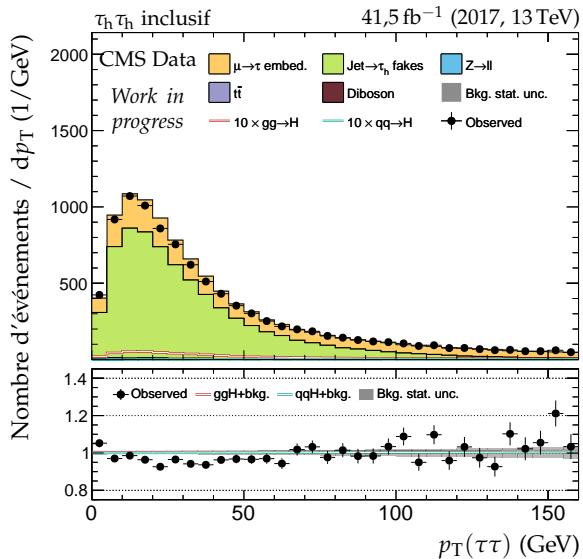
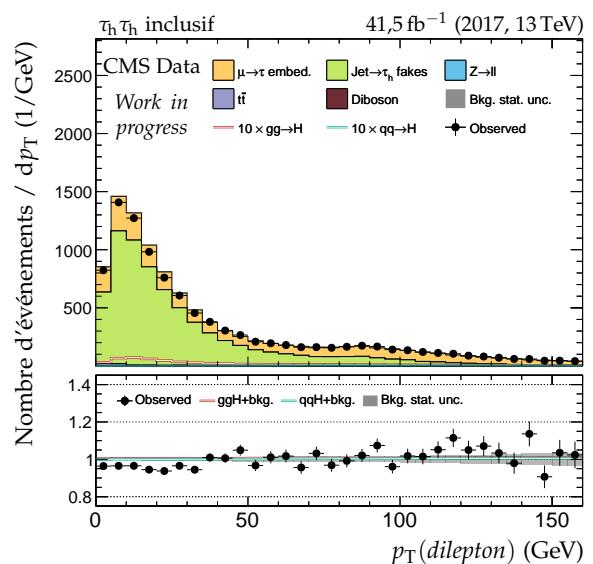
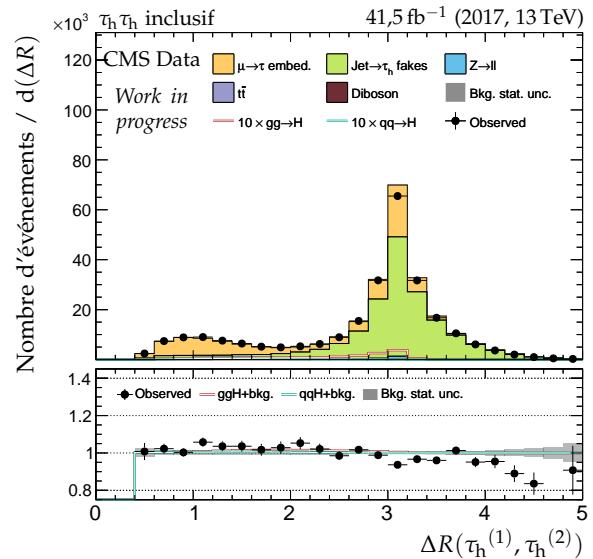


Figure X.24 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2017 : masses transverses et D_ζ .

**(e) Masse du système di- τ d'après SVFIT.****Figure X.25 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2017 : dilepton et énergie transverse manquante.**

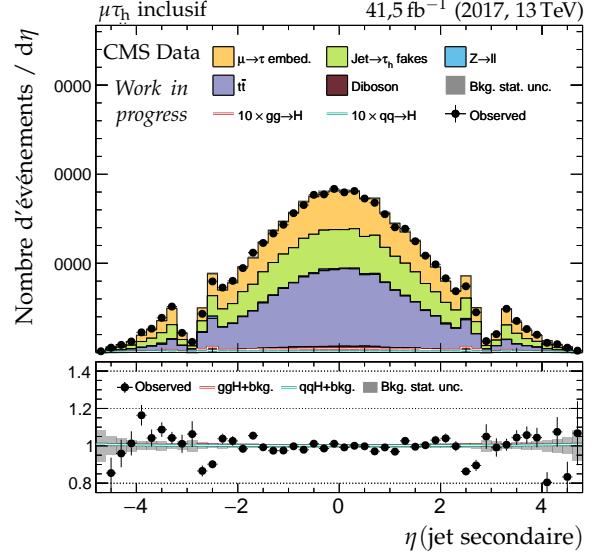
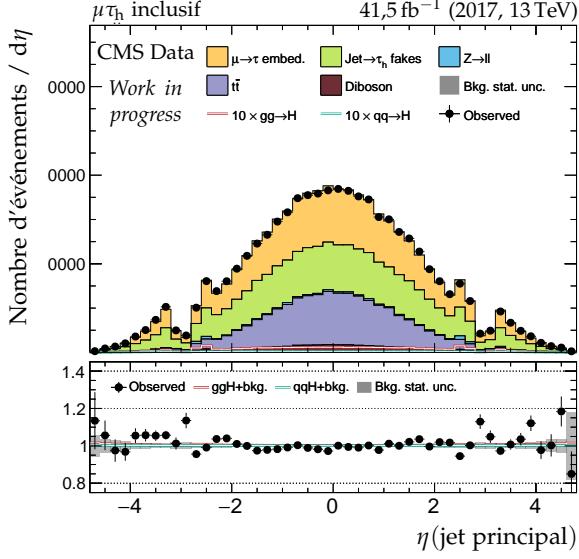
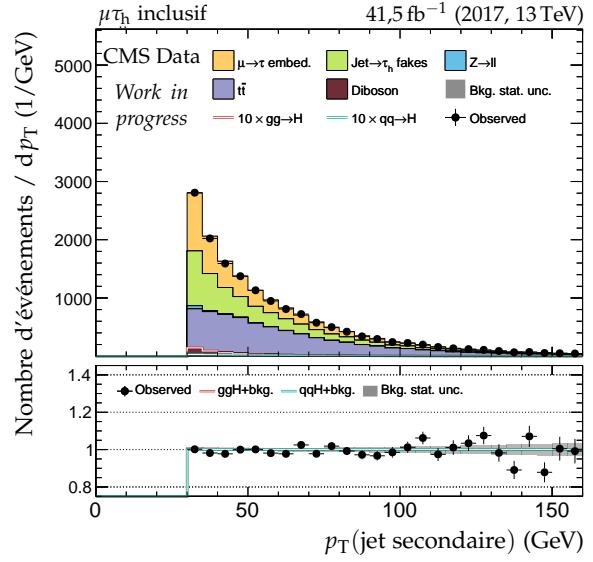
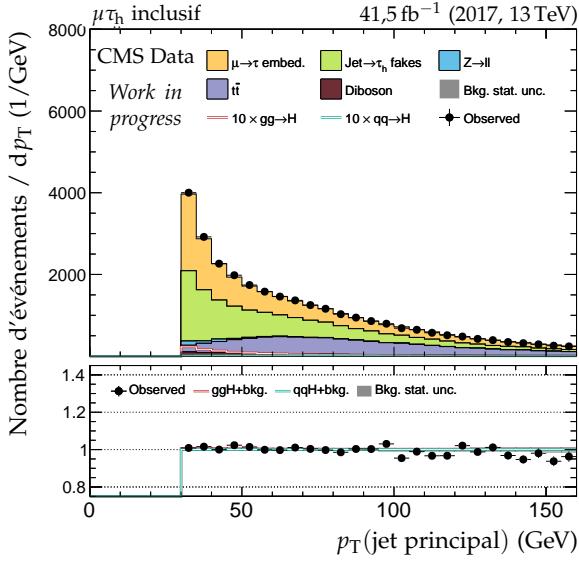
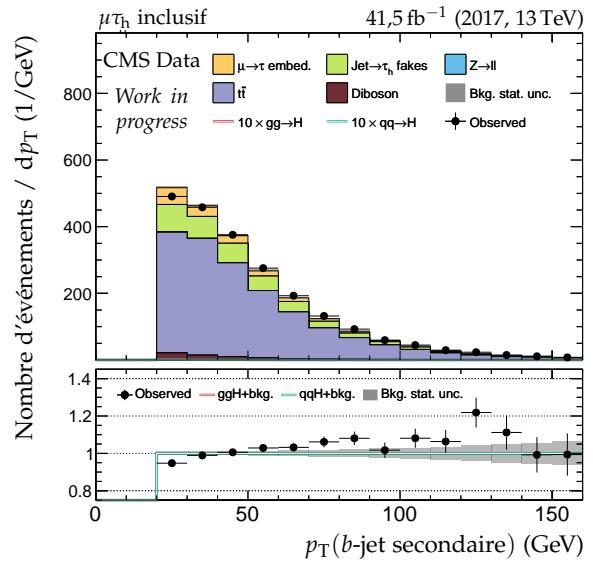
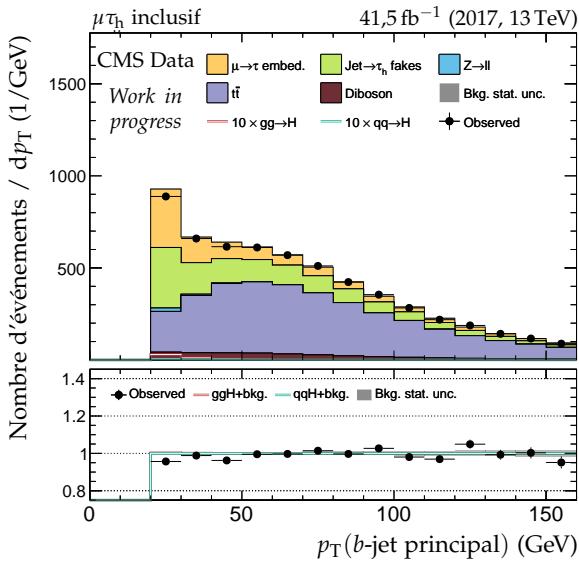


Figure X.26 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2017 : cinématique des jets.

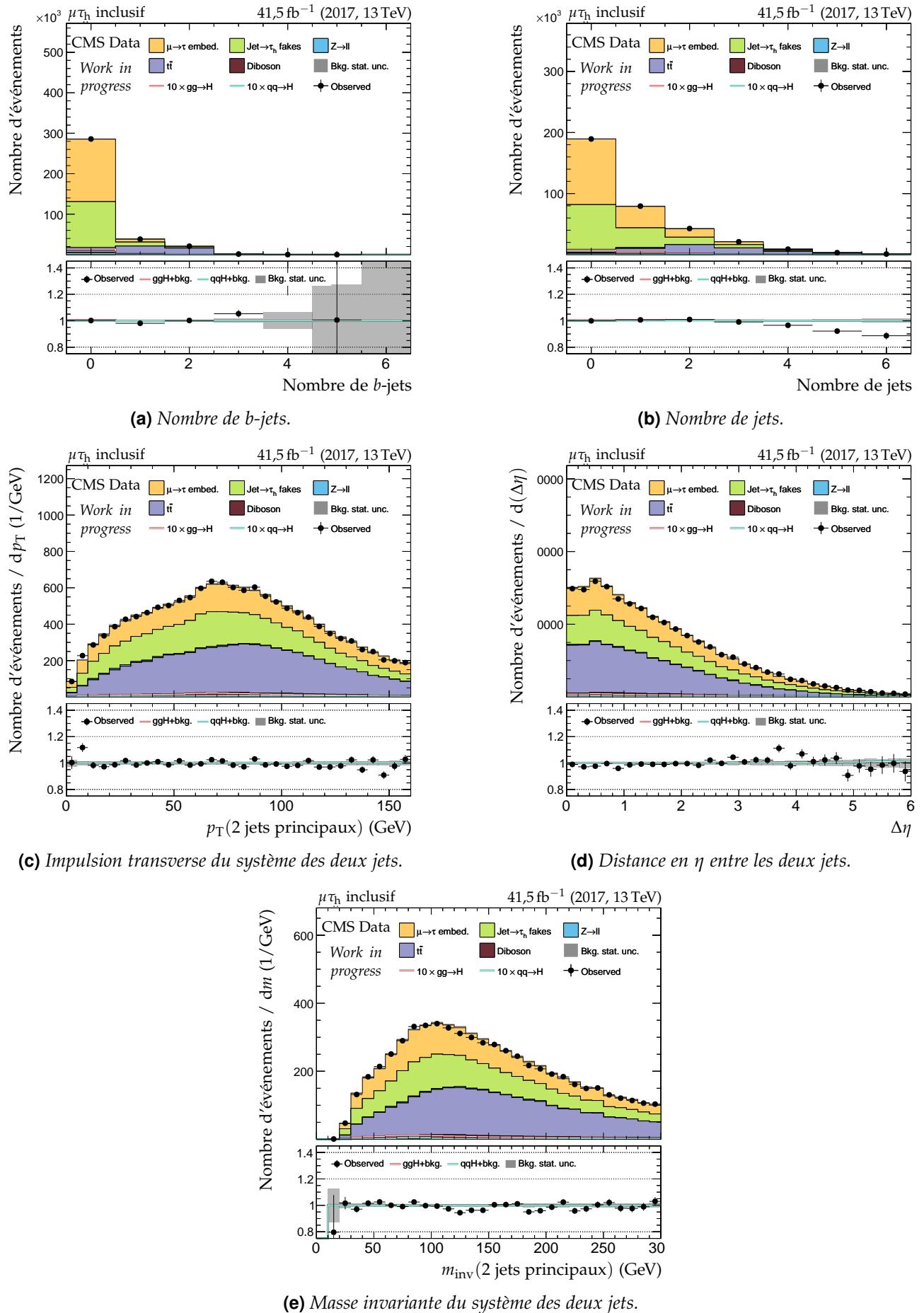


Figure X.27 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2017 : nombre de jets et système des deux jets principaux.

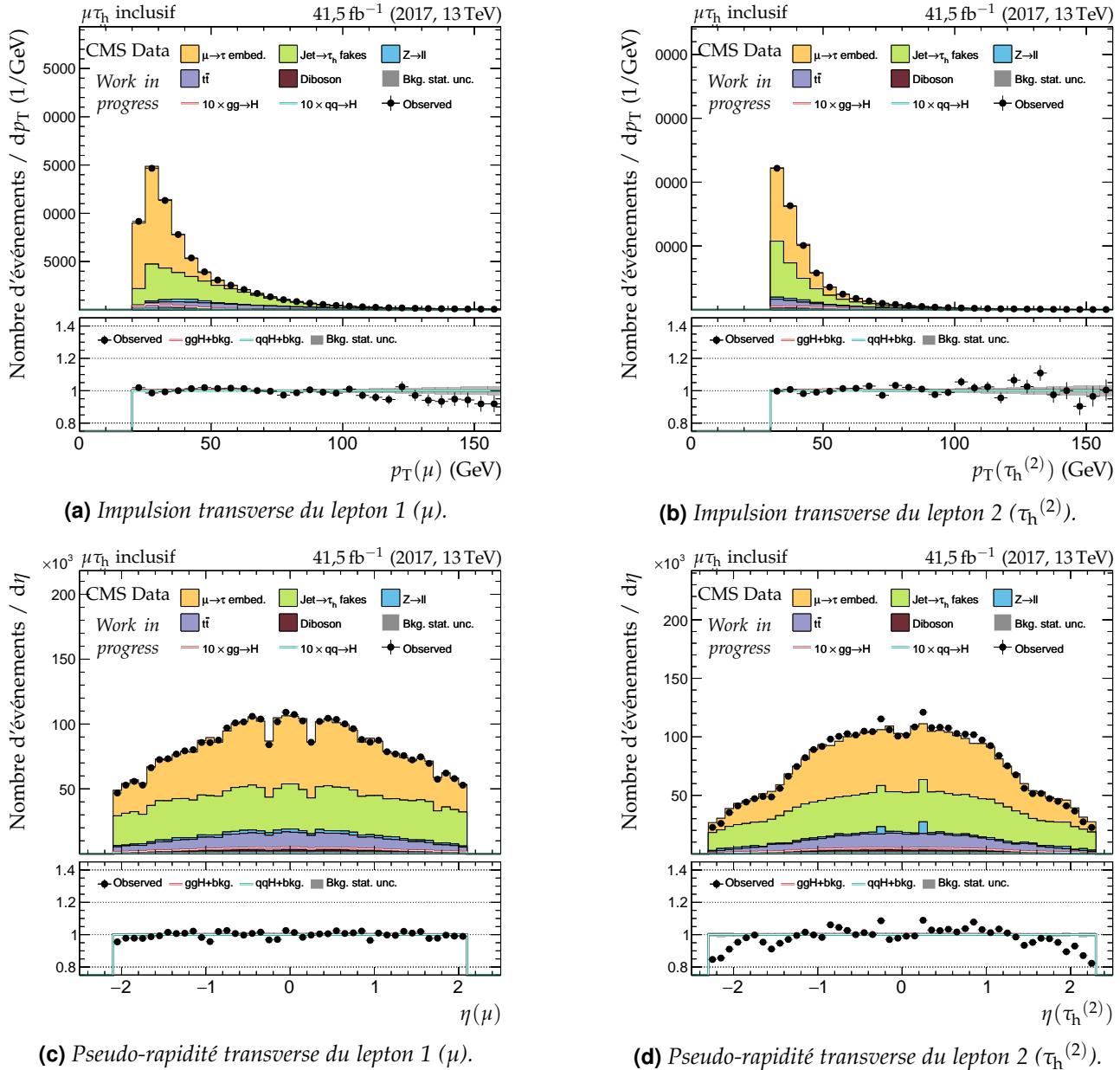
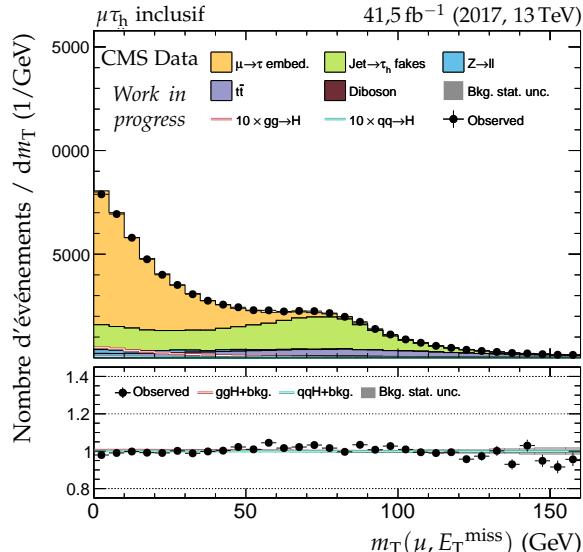
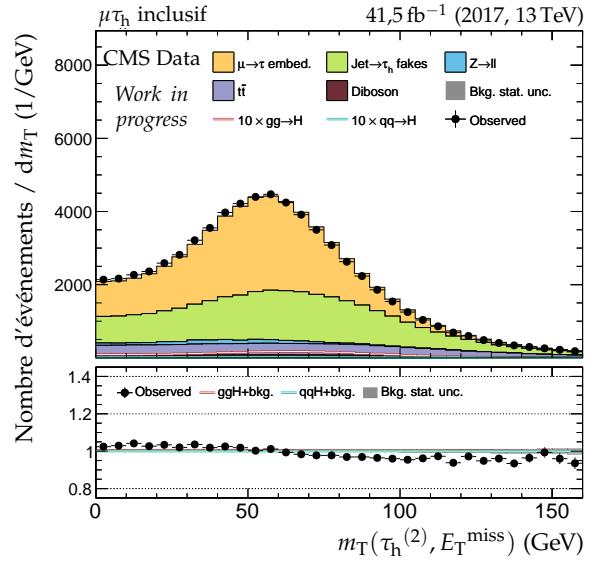


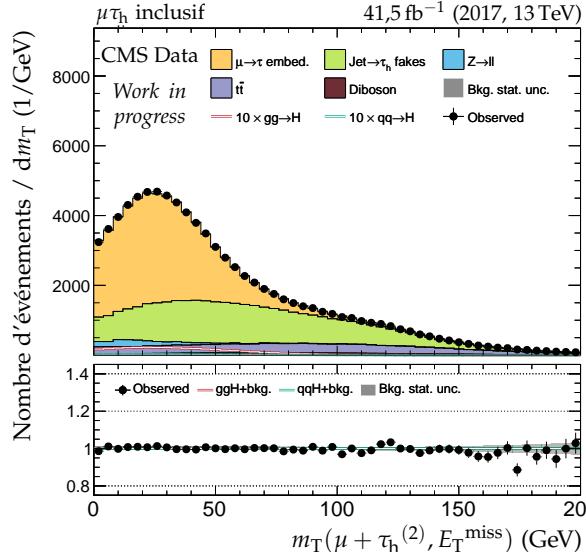
Figure X.28 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2017 : cinématique des leptons ($\mu, \tau_h^{(2)}$).



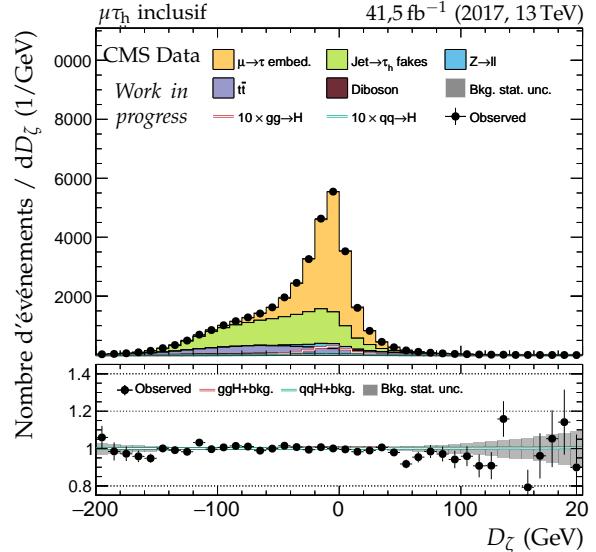
(a) Masse transverse du lepton 1 (μ).



(b) Masse transverse du lepton 2 ($\tau_h^{(2)}$).



(c) Masse transverse du dilepton.



(d) Valeur de D_ζ .

Figure X.29 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2017 : masses transverses et D_ζ .

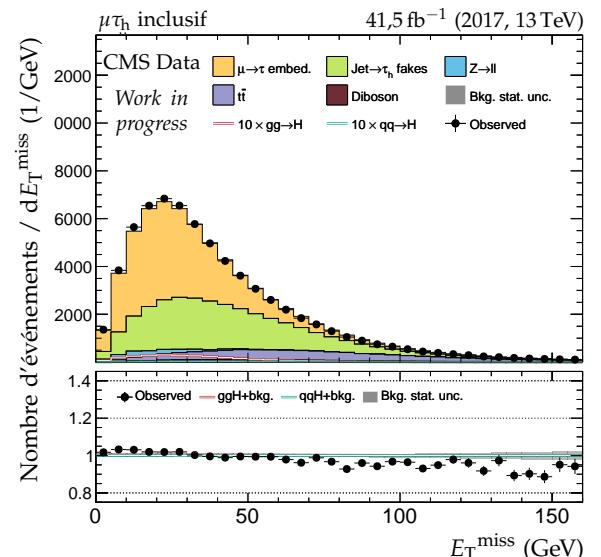
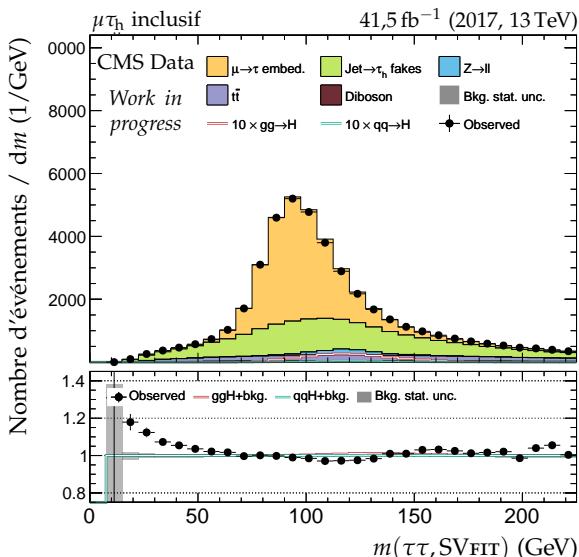
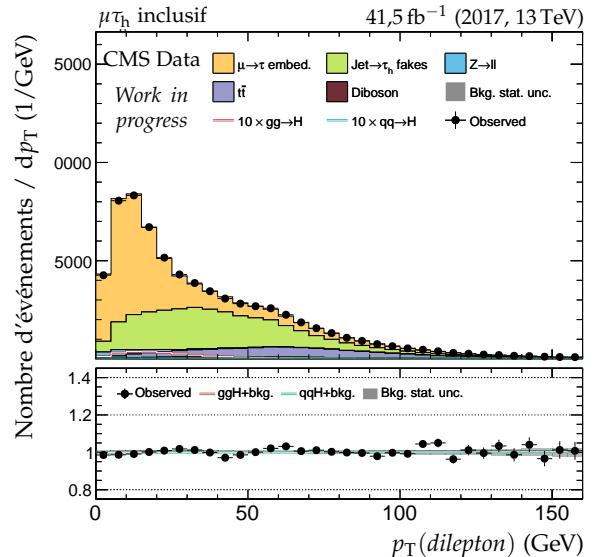
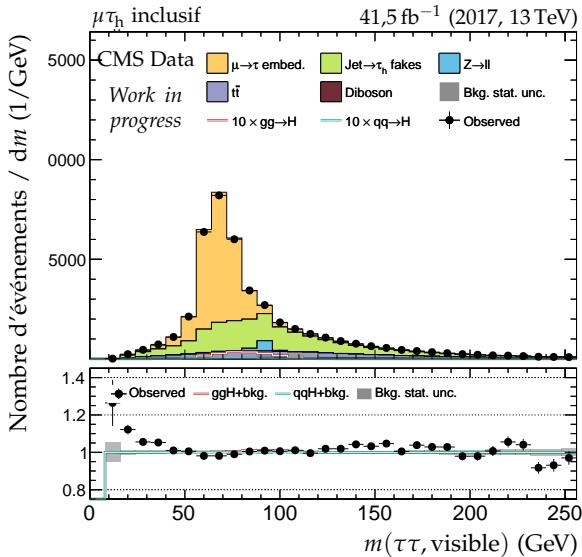
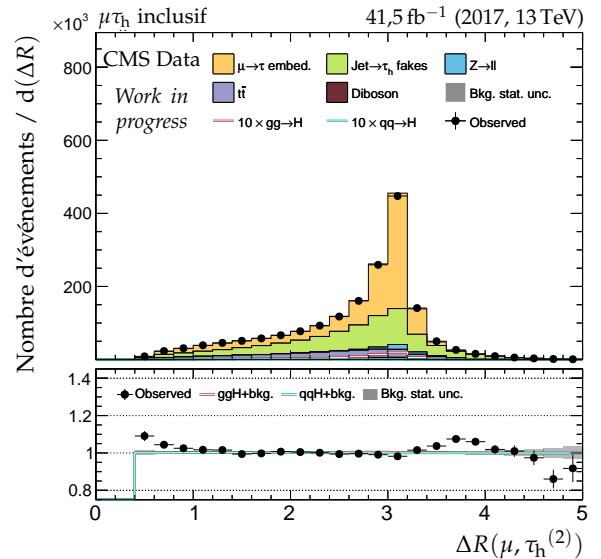
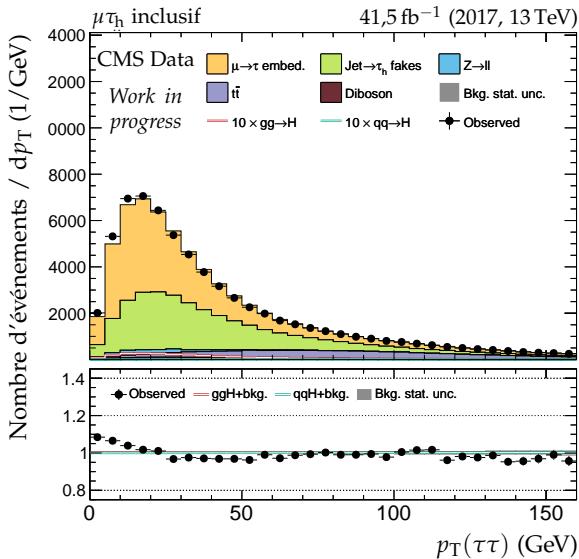


Figure X.30 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2017 : dilepton et énergie transverse manquante.

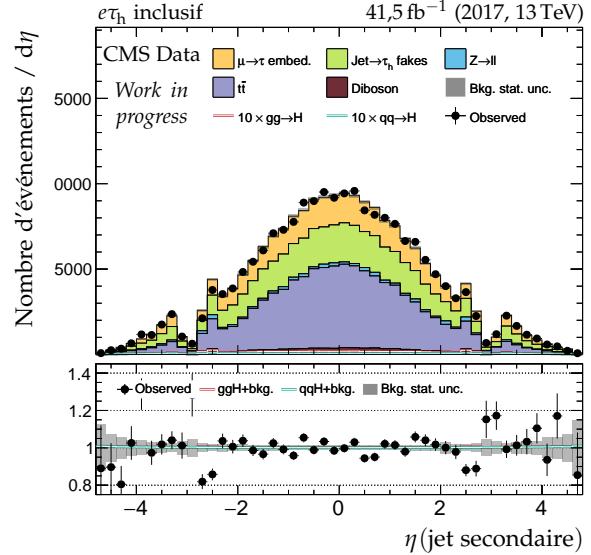
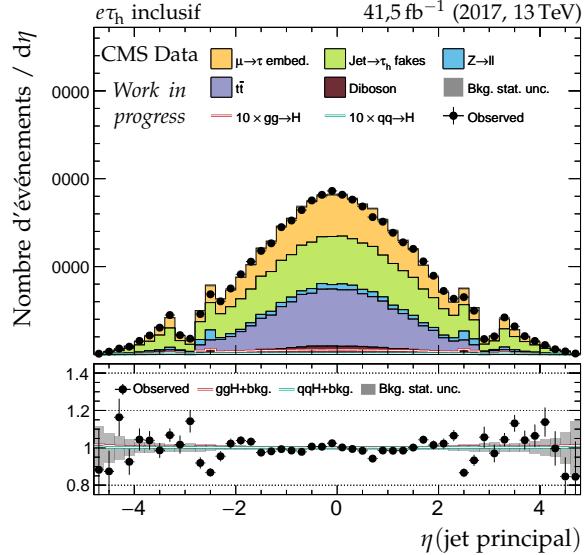
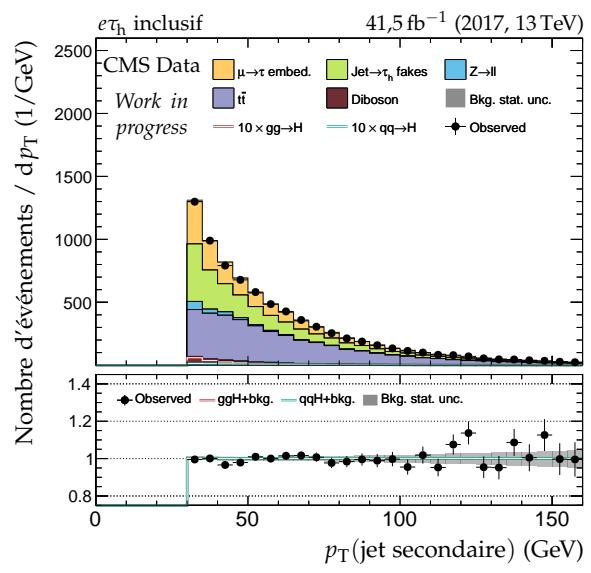
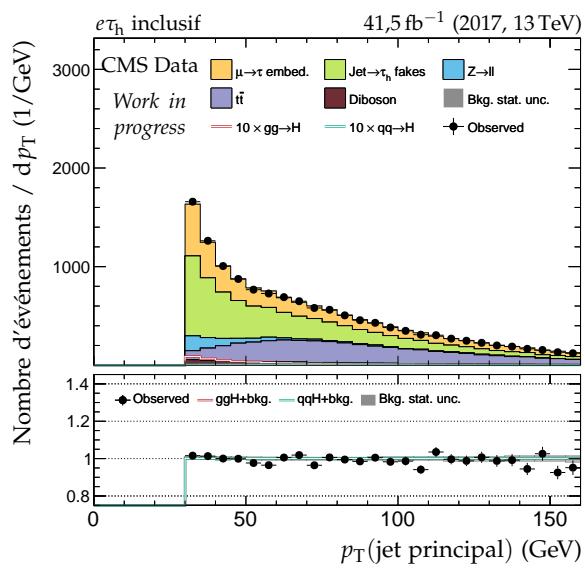
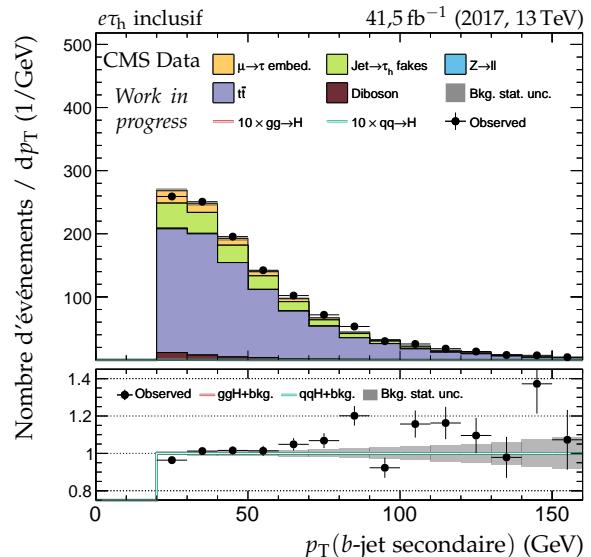
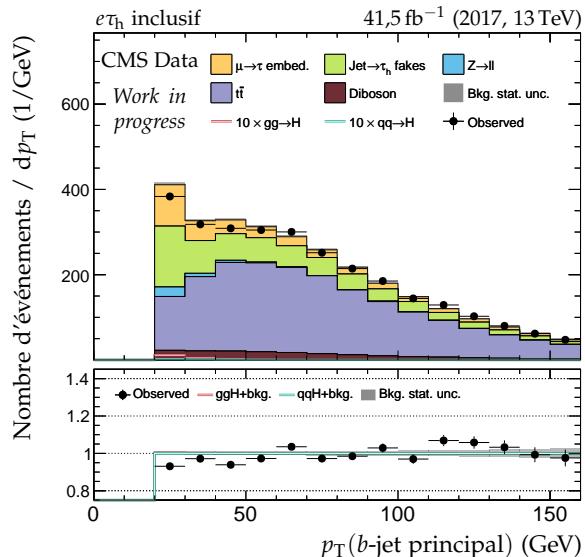


Figure X.31 – Distributions de contrôle pour le canal $e\tau_h$ en 2017 : cinématique des jets.

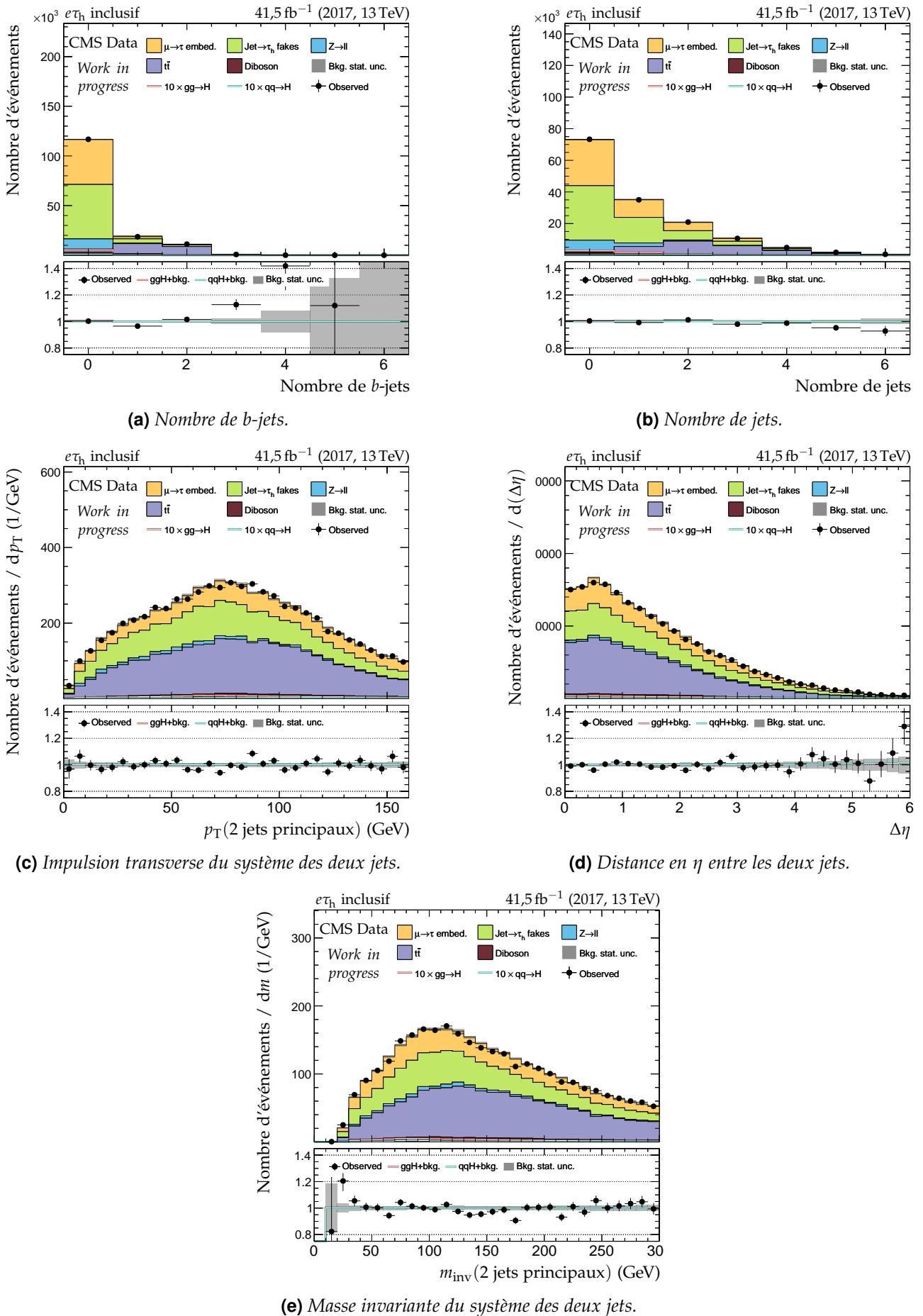


Figure X.32 – Distributions de contrôle pour le canal $e\tau_h$ en 2017 : nombre de jets et système des deux jets principaux.

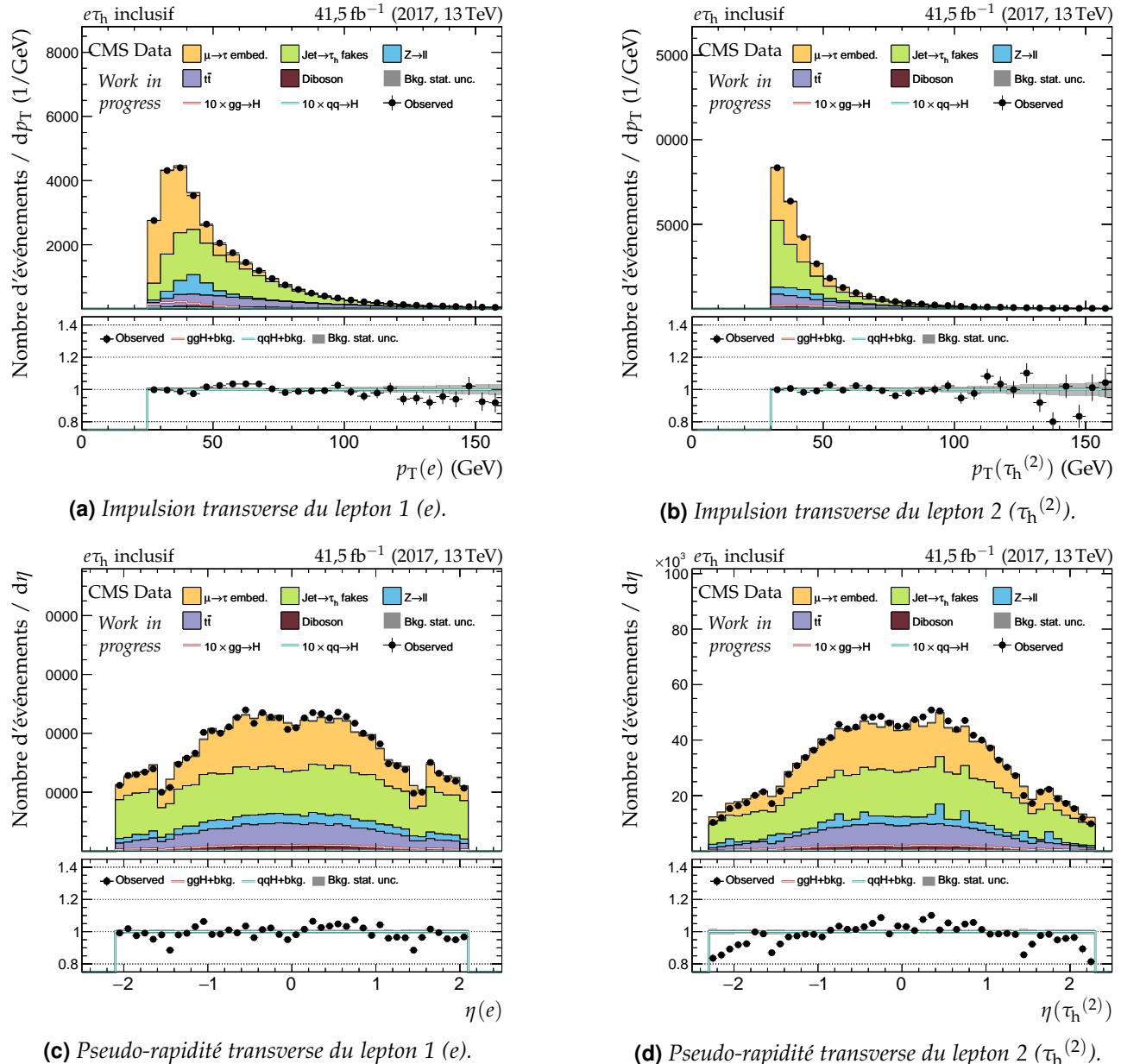


Figure X.33 – Distributions de contrôle pour le canal $e\tau_h$ en 2017 : cinématique des leptons ($e, \tau_h^{(2)}$).

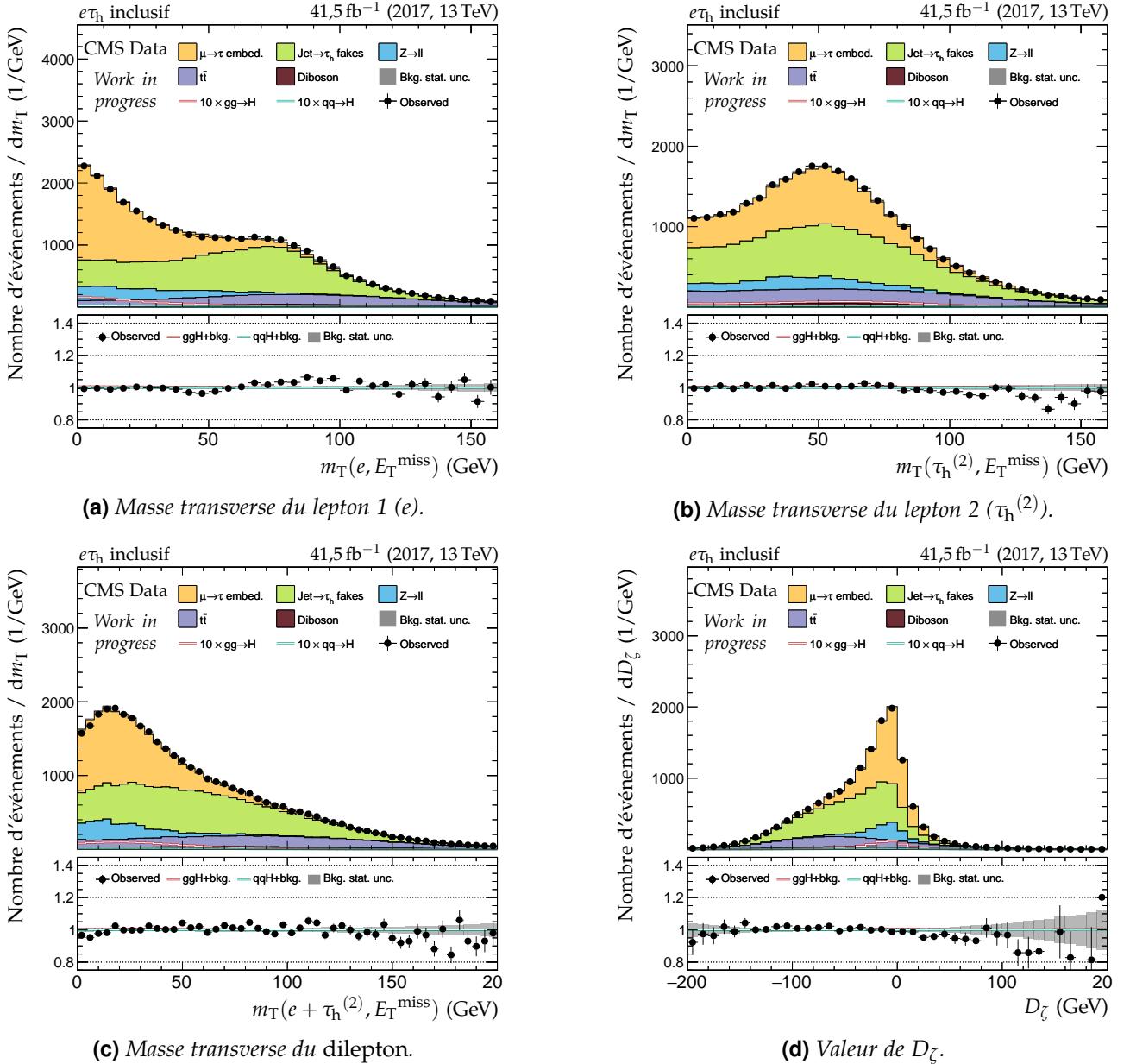


Figure X.34 – Distributions de contrôle pour le canal $e\tau_h$ en 2017 : masses transverses et D_ζ .

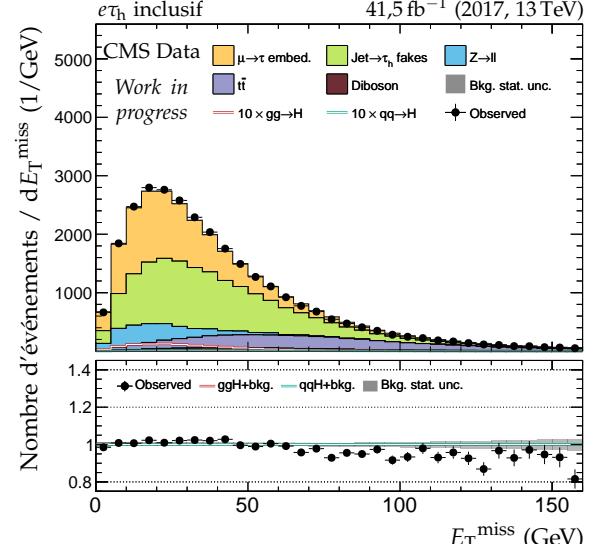
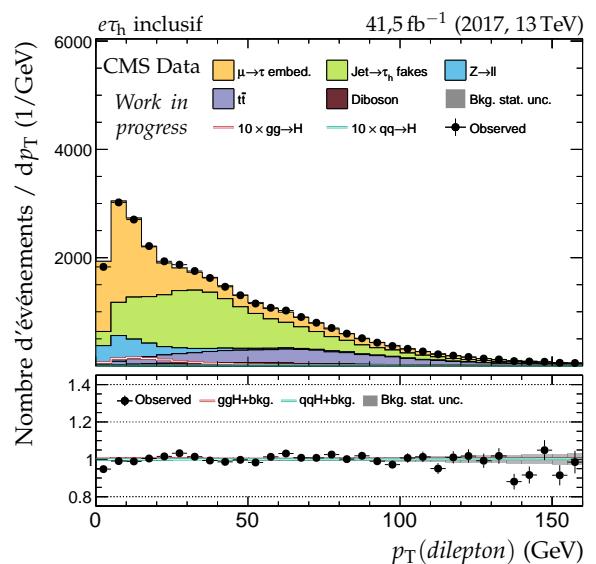
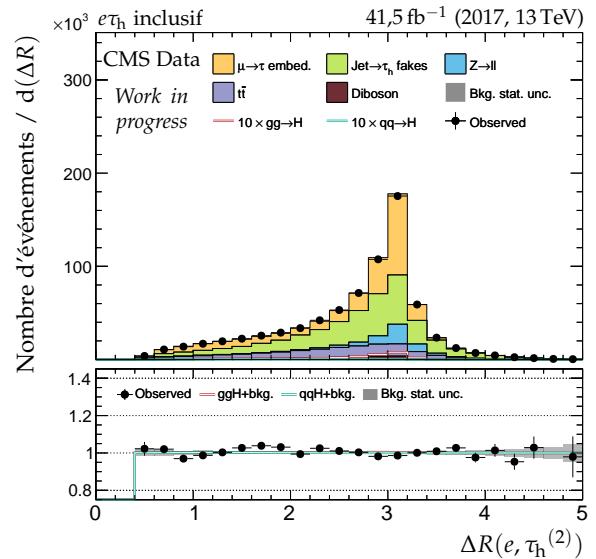
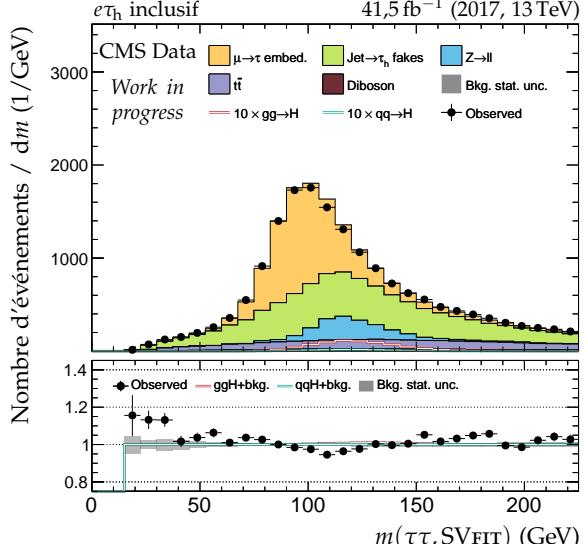
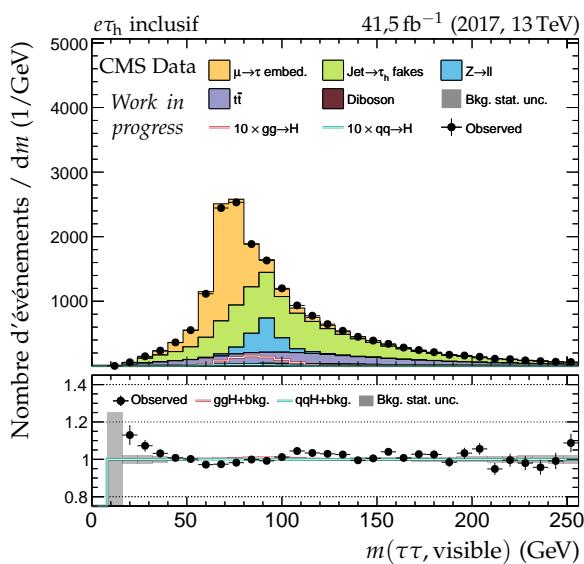
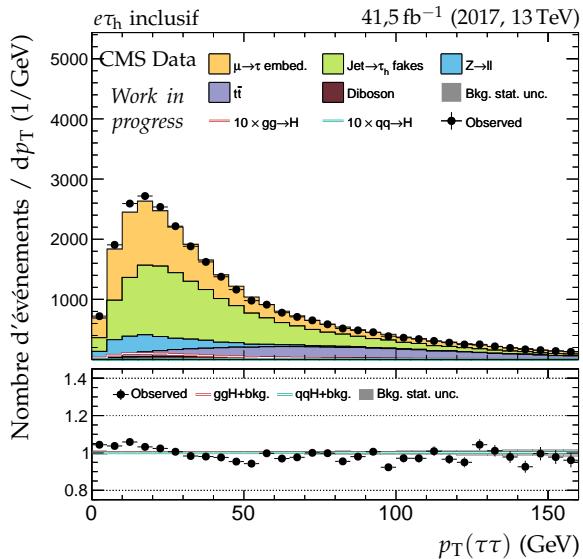


Figure X.35 – Distributions de contrôle pour le canal $e\tau_h$ en 2017 : dilepton et énergie transverse manquante.

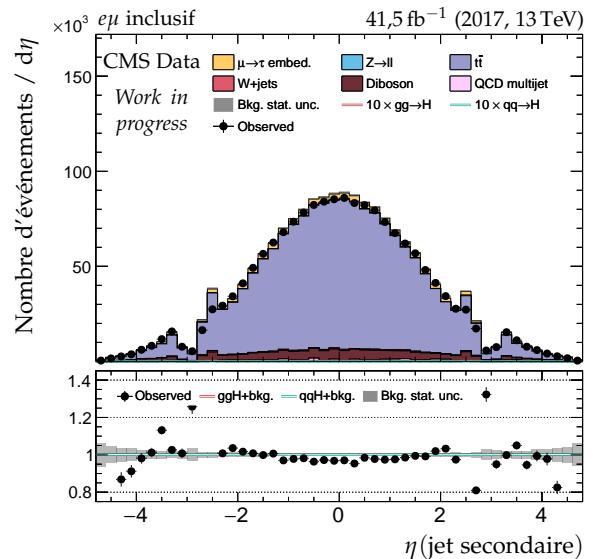
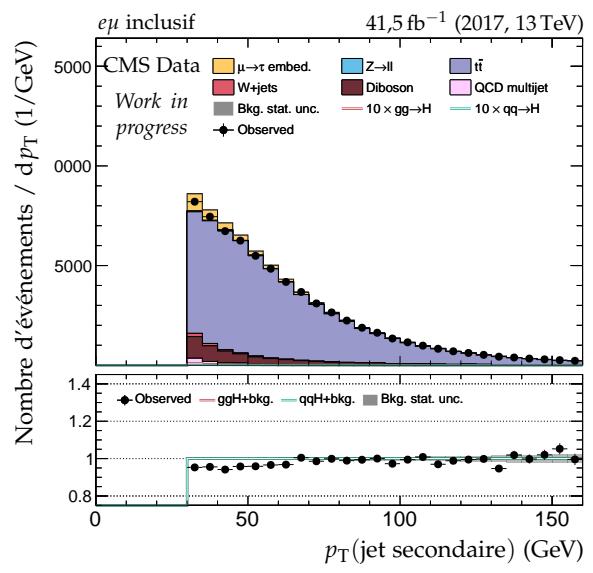
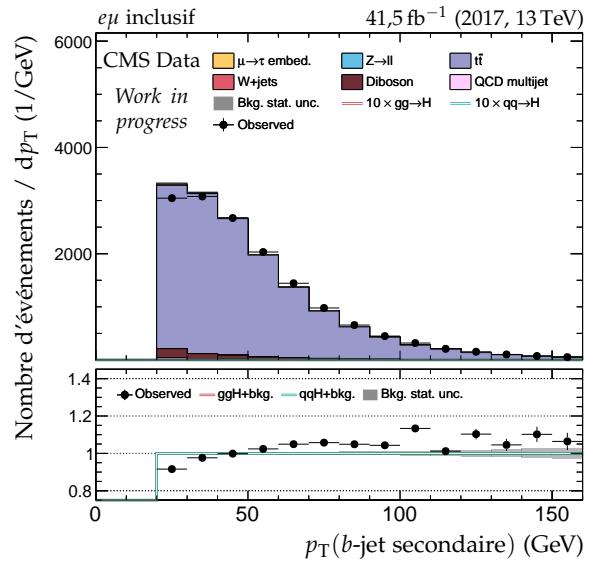
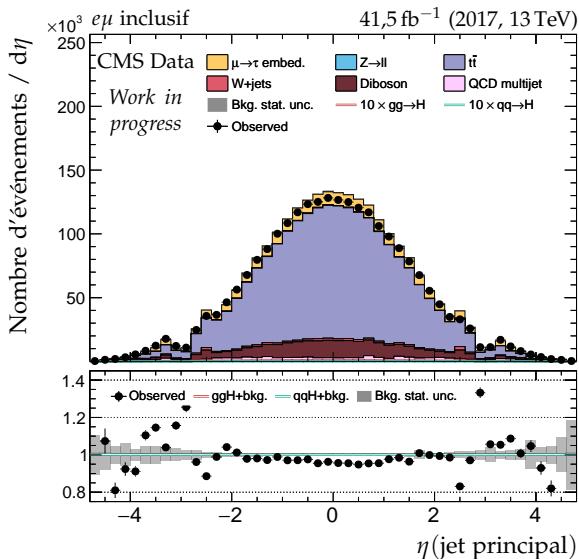
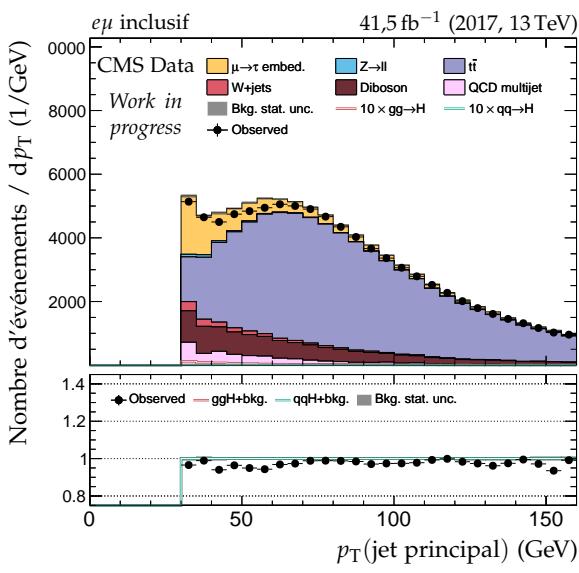
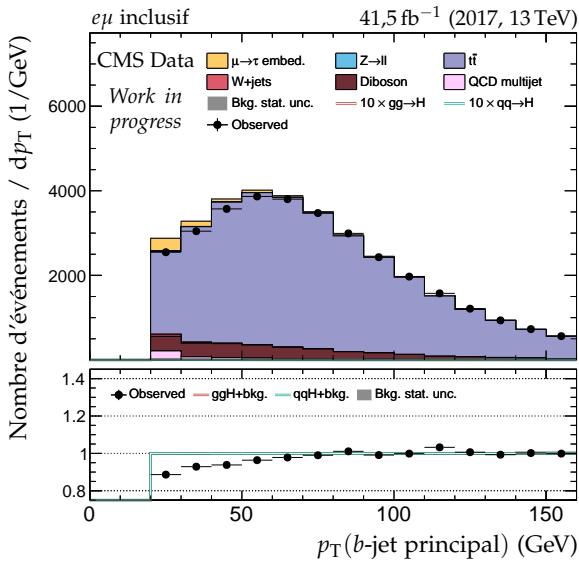
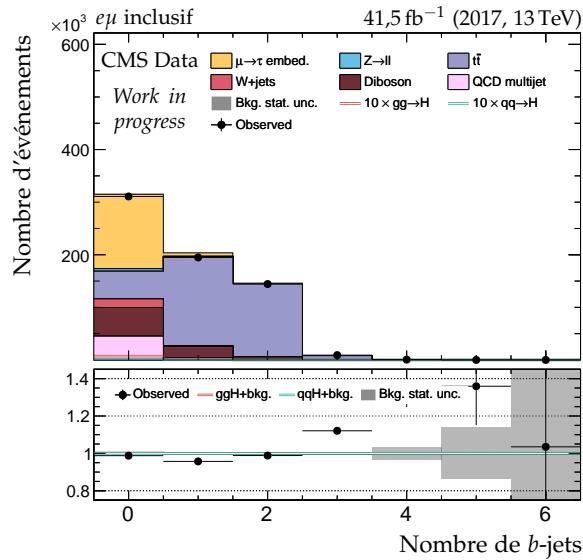
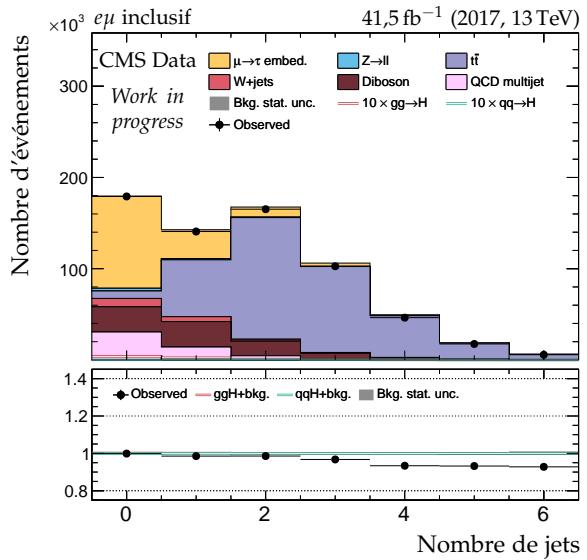
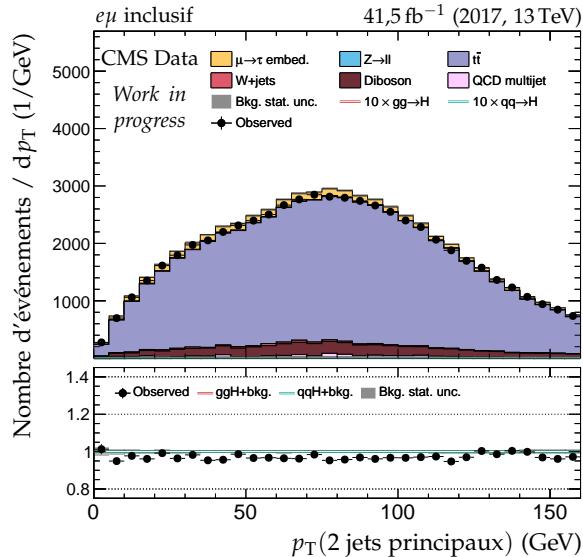


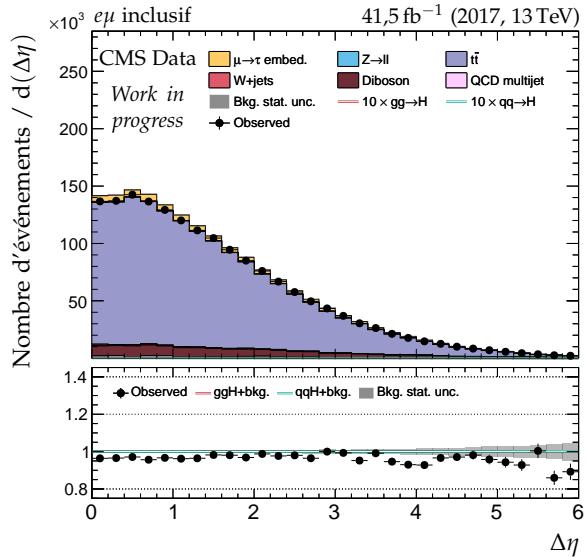
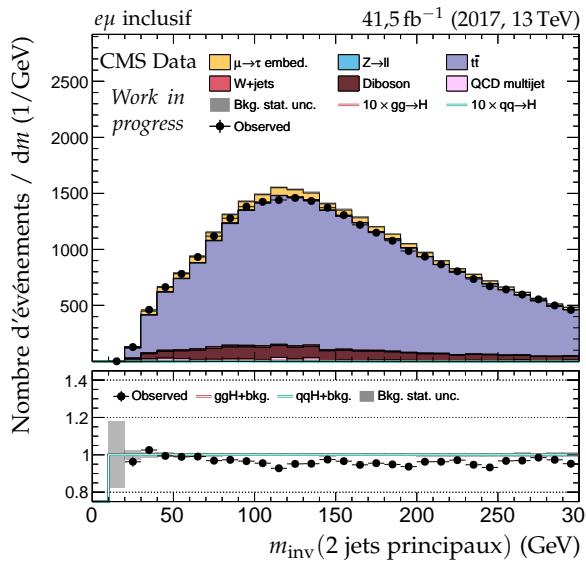
Figure X.36 – Distributions de contrôle pour le canal $e\mu$ en 2017 : cinématique des jets.

(a) Nombre de b -jets.

(b) Nombre de jets.



(c) Impulsion transverse du système des deux jets.

(d) Distance en η entre les deux jets.

(e) Masse invariante du système des deux jets.

Figure X.37 – Distributions de contrôle pour le canal $e\mu$ en 2017 : nombre de jets et système des deux jets principaux.

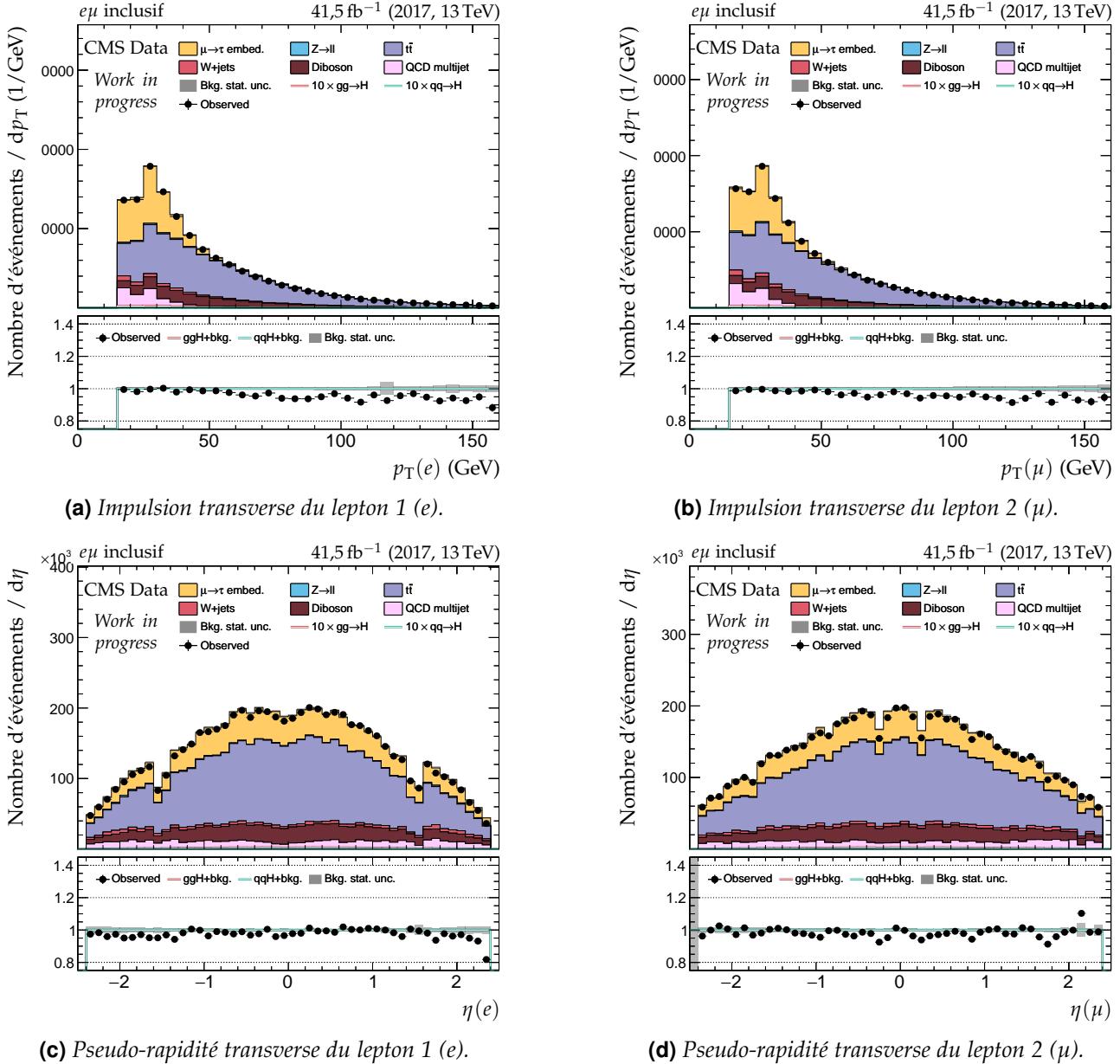


Figure X.38 – Distributions de contrôle pour le canal $e\mu$ en 2017 : cinématique des leptons (e, μ).

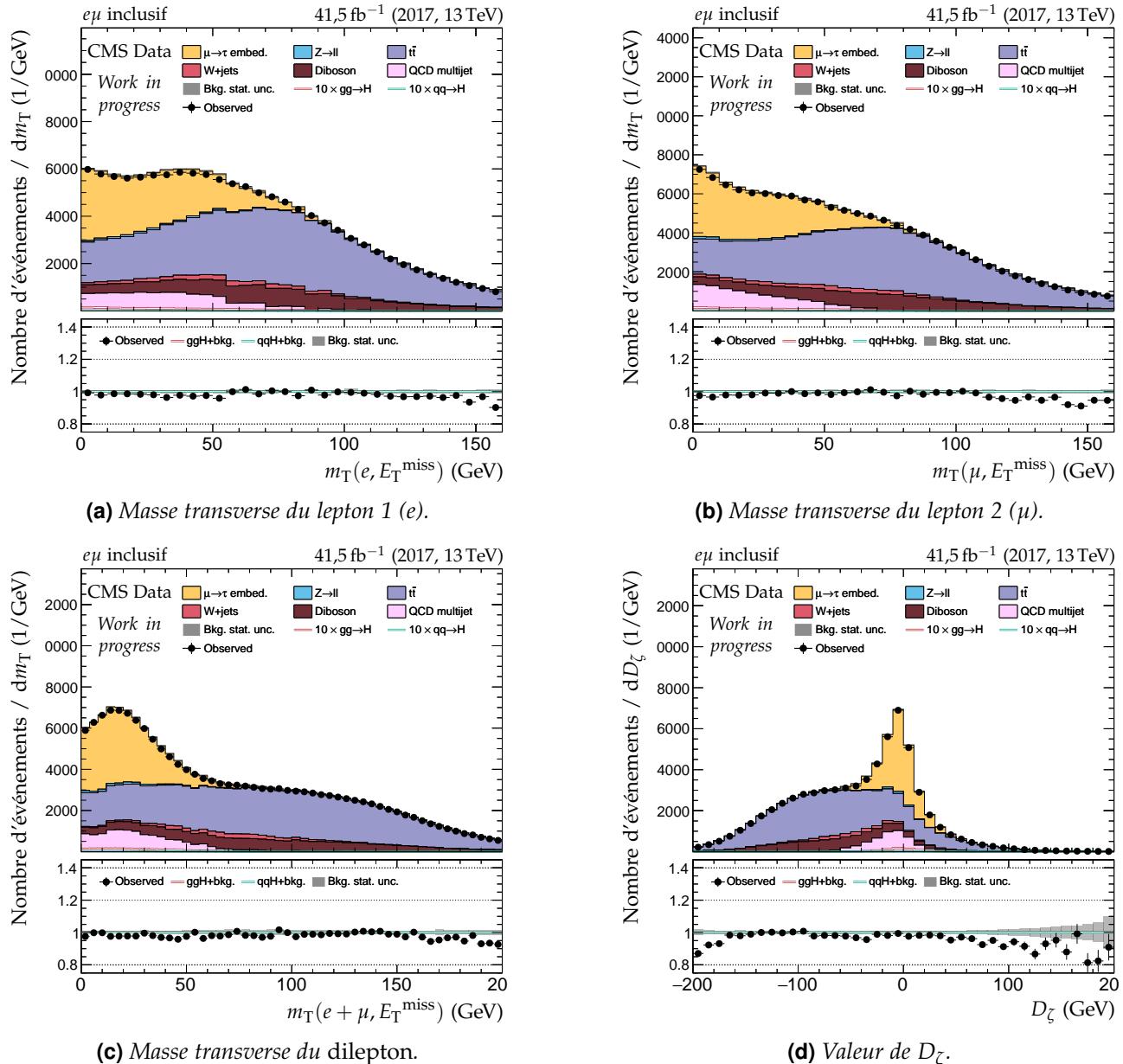


Figure X.39 – Distributions de contrôle pour le canal $e\mu$ en 2017 : masses transverses et D_ζ .

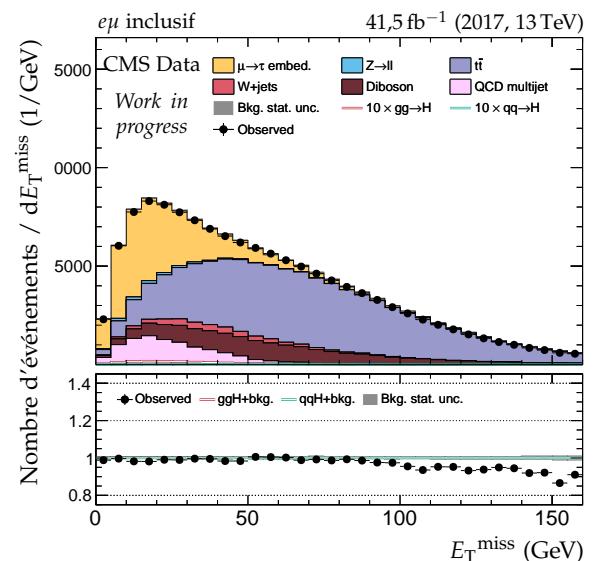
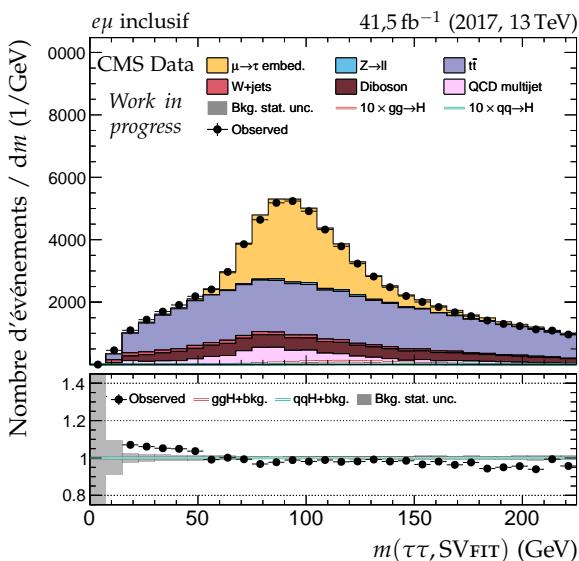
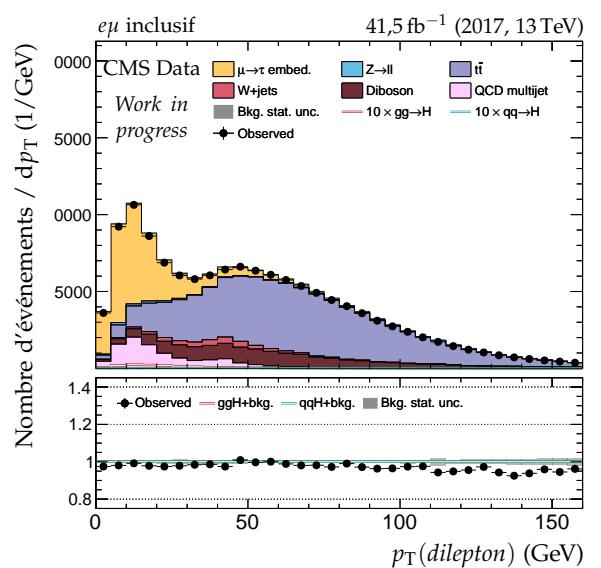
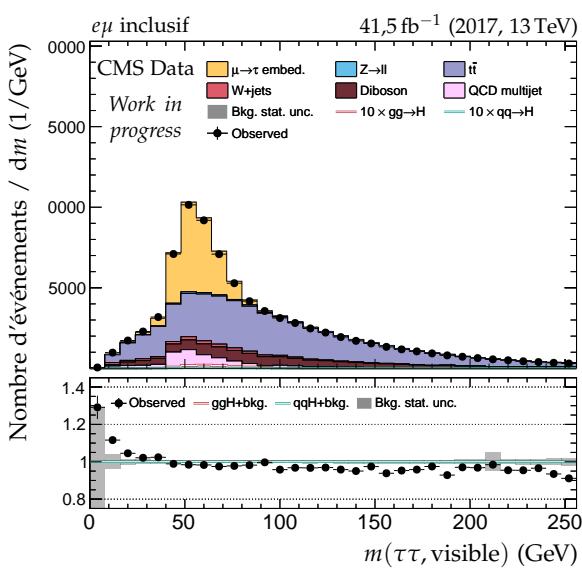
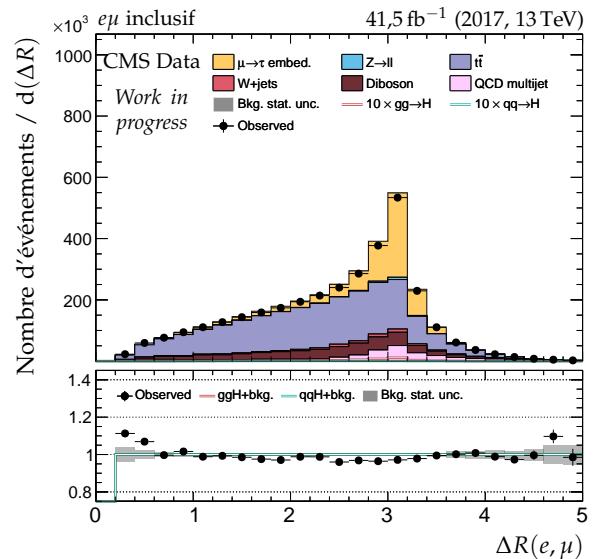
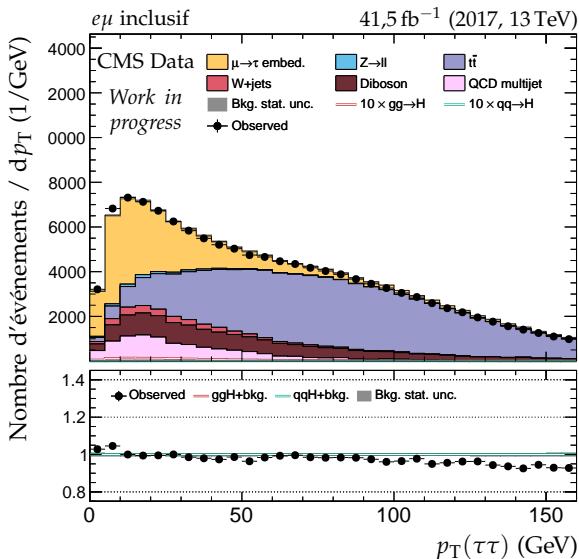
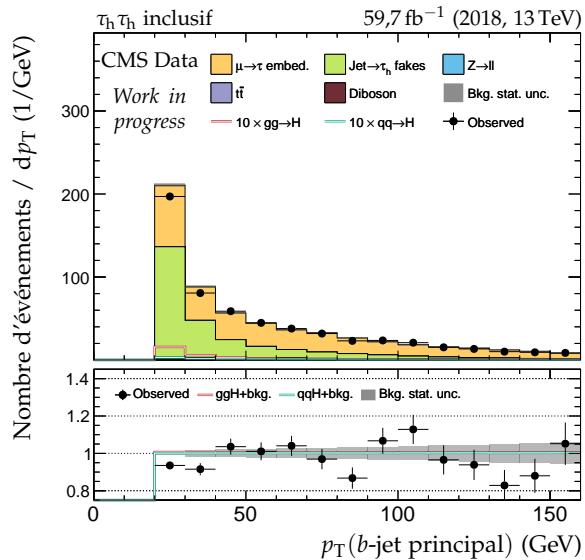
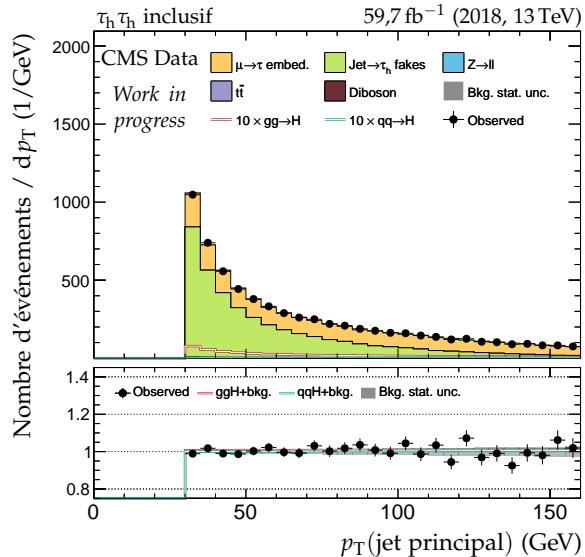


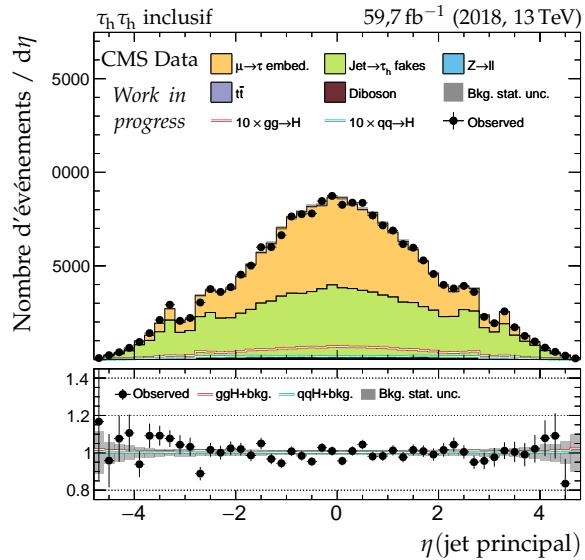
Figure X.40 – Distributions de contrôle pour le canal $e\mu$ en 2017 : dilepton et énergie transverse manquante.



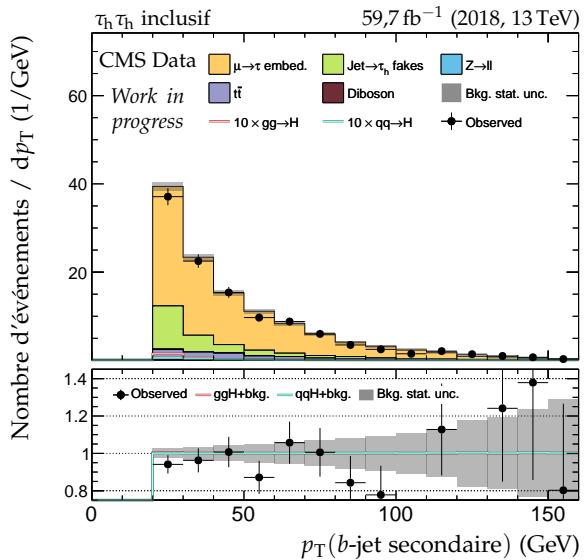
(a) Impulsion transverse du b-jet principal.



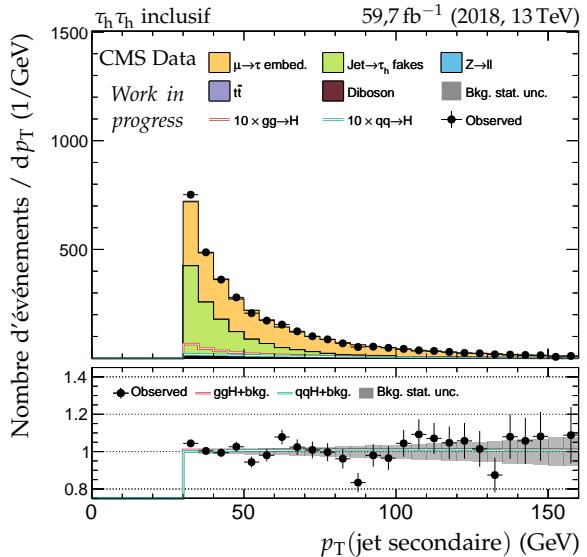
(c) Impulsion transverse du jet principal.



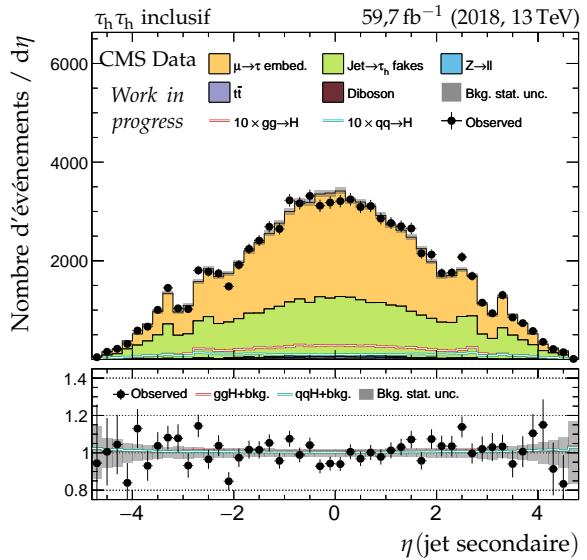
(e) Pseudo-rapidité du jet principal.



(b) Impulsion transverse du b-jet secondaire.



(d) Impulsion transverse du jet secondaire.



(f) Pseudo-rapidité du jet secondaire.

Figure X.41 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2018 : cinématique des jets.

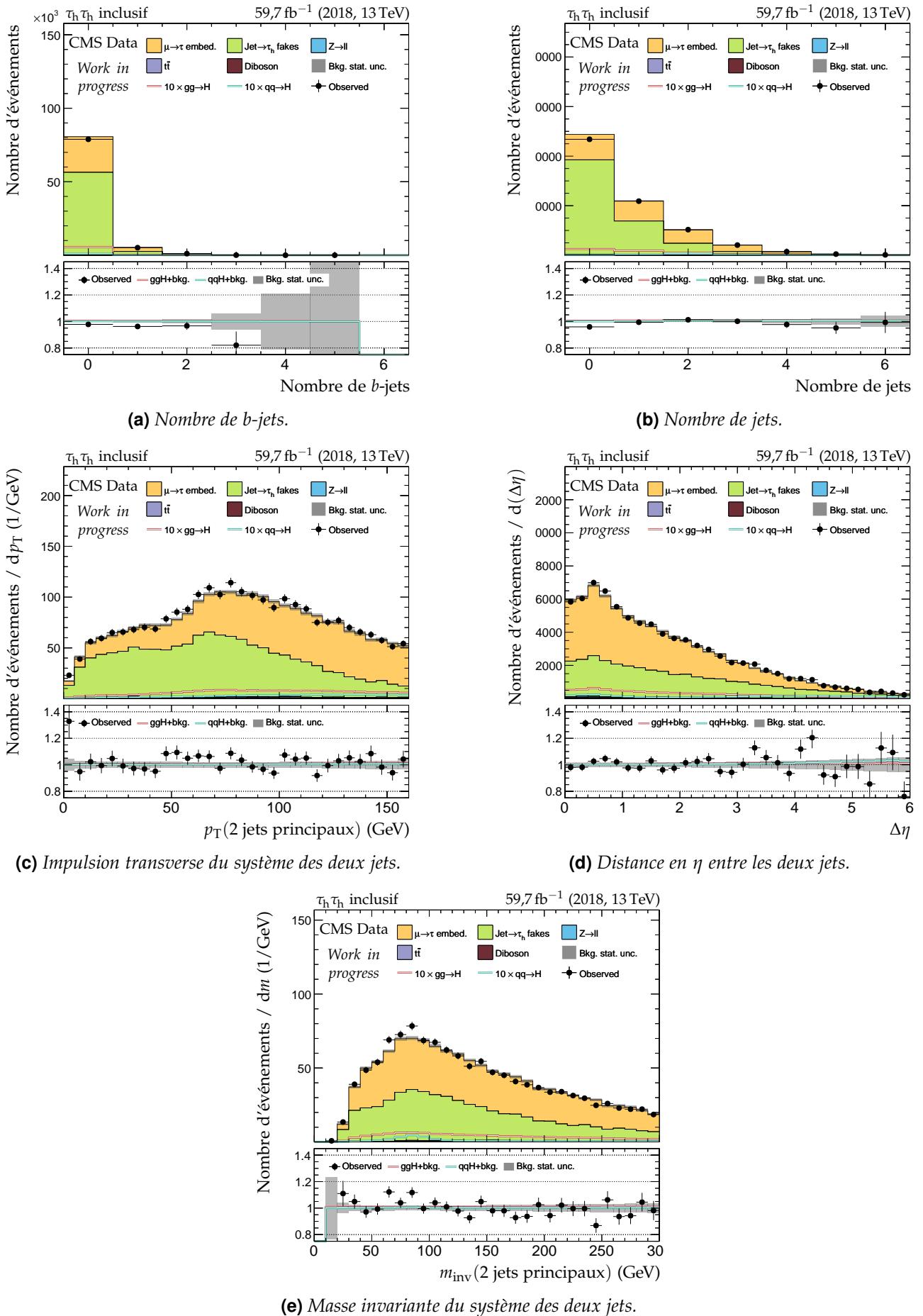


Figure X.42 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2018 : nombre de jets et système des deux jets principaux.

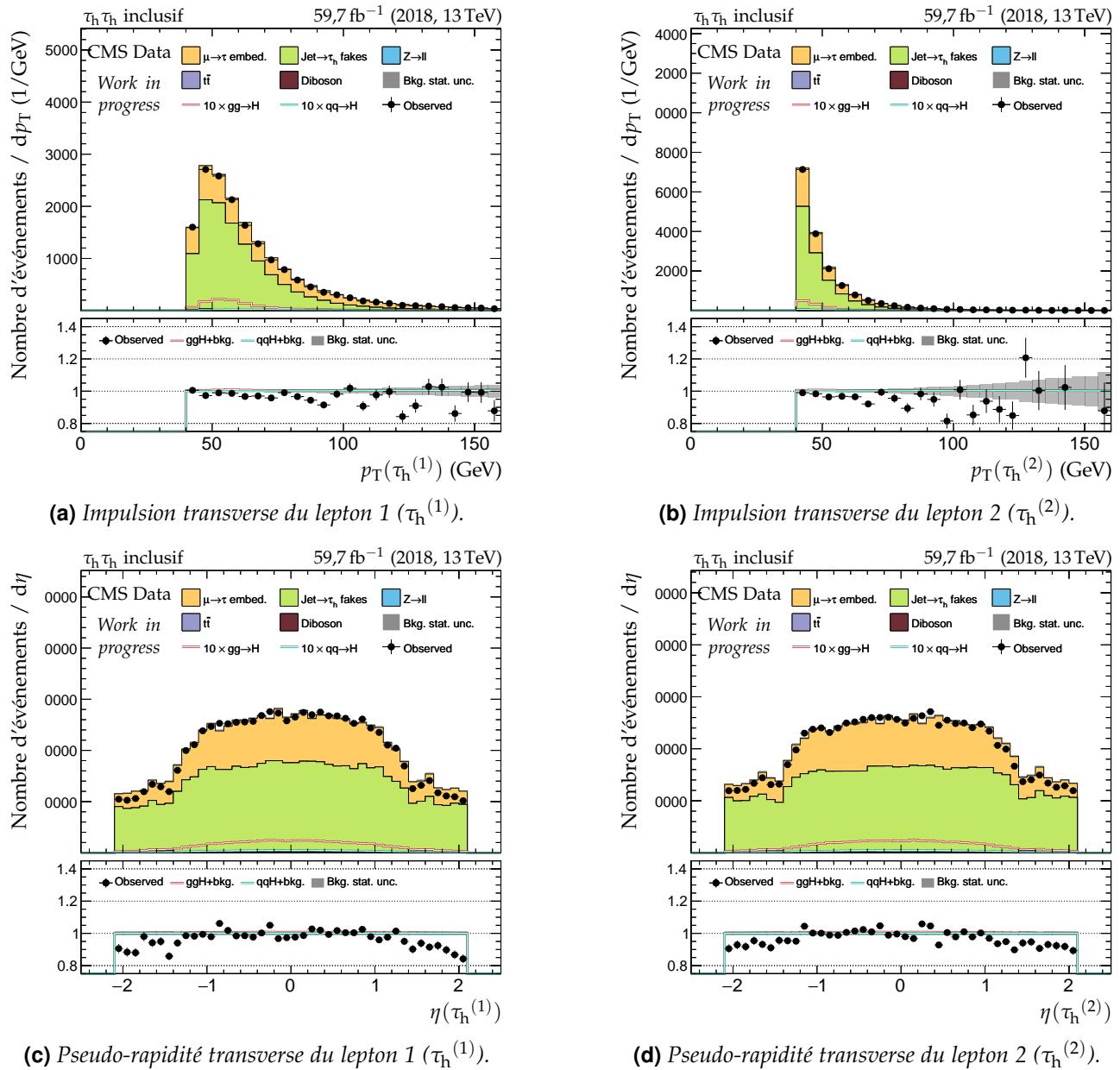


Figure X.43 – Distributions de contrôle pour le canal $\tau_h\tau_h$ en 2018 : cinématique des leptons ($\tau_h^{(1)}, \tau_h^{(2)}$).

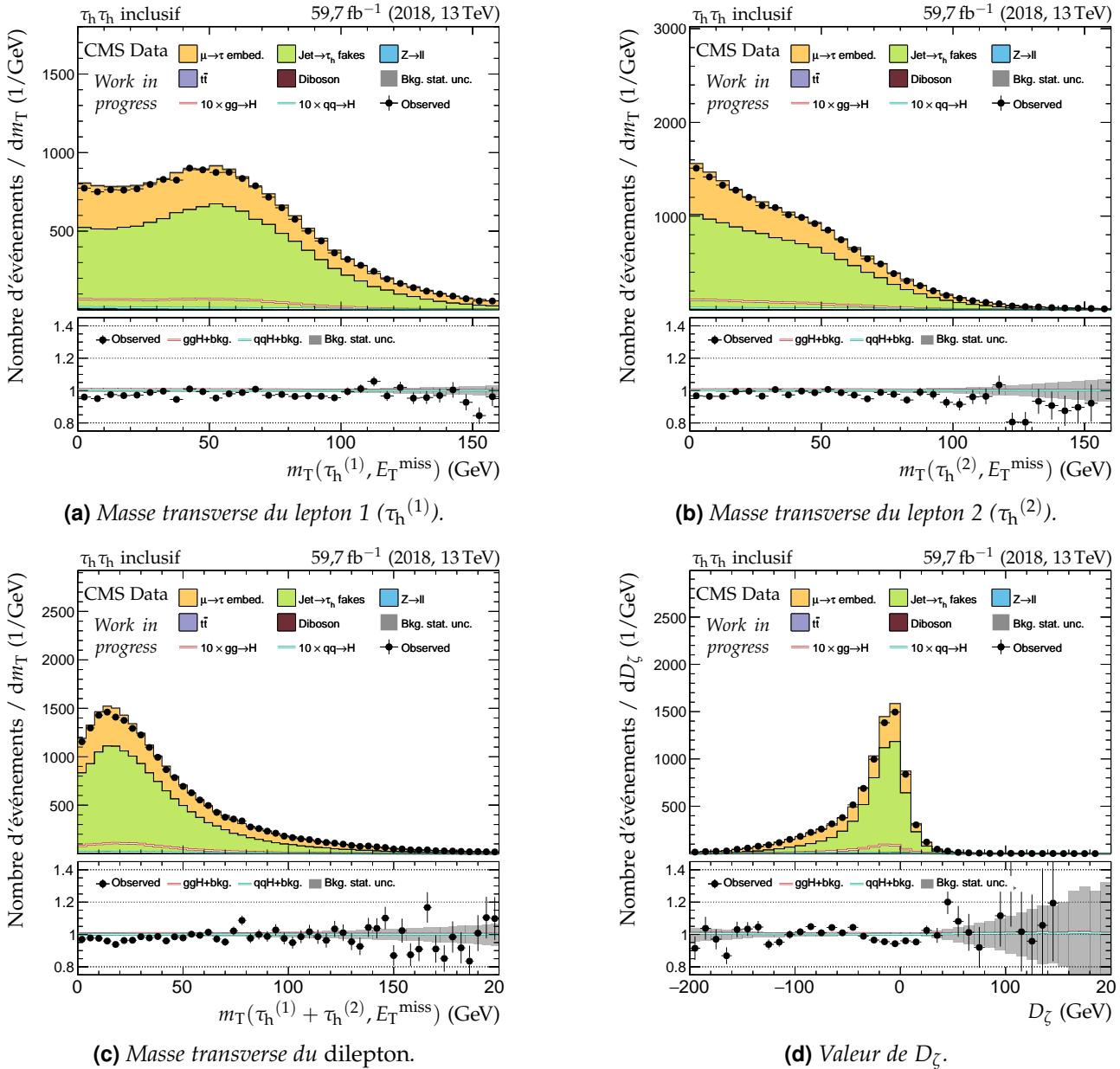
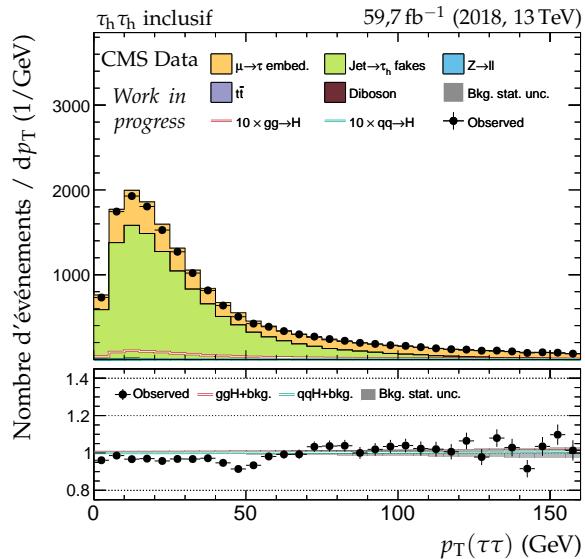
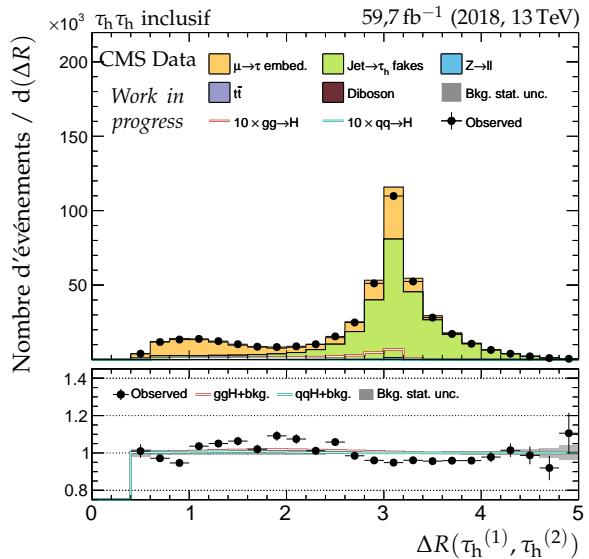
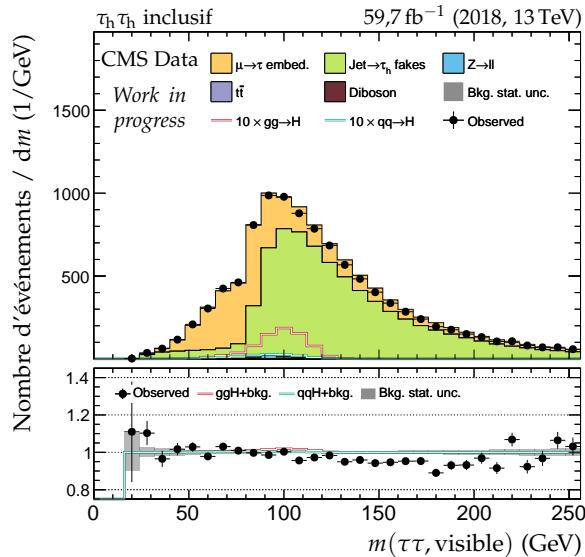
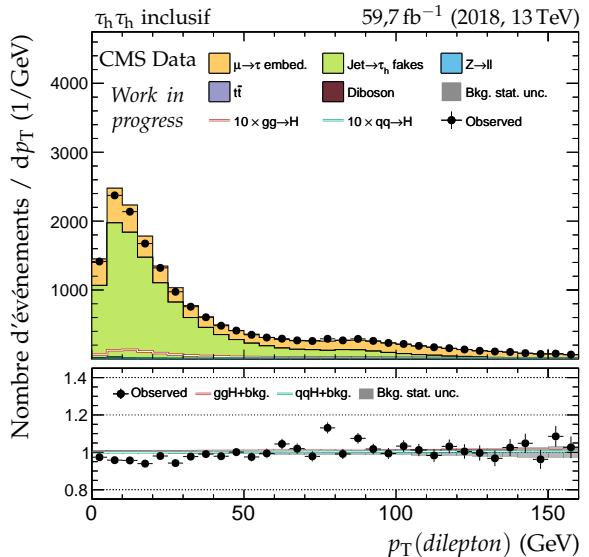
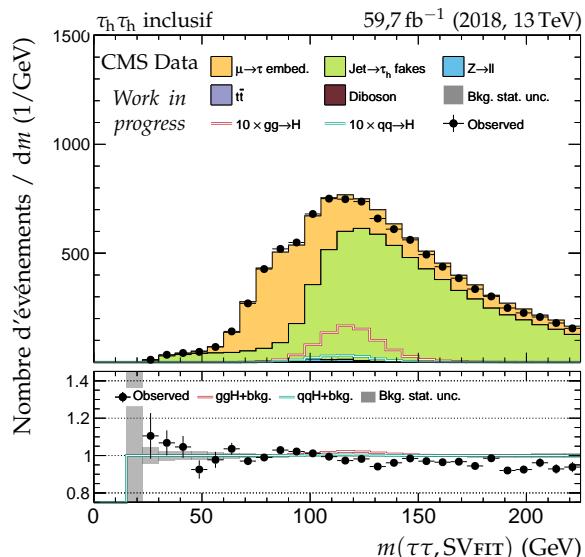
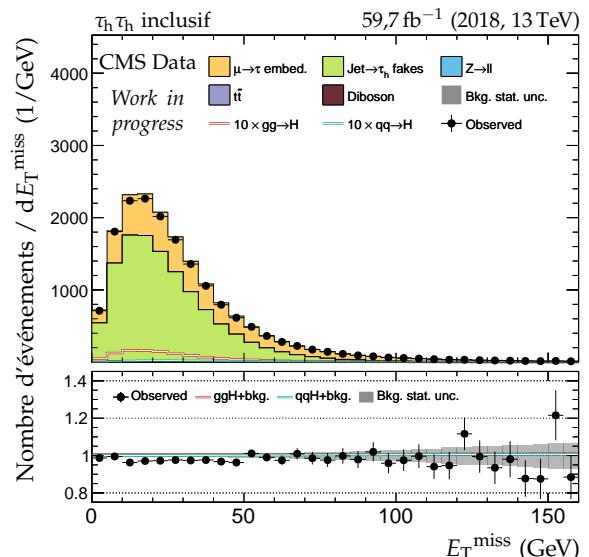


Figure X.44 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2018 : masses transverses et D_ζ .

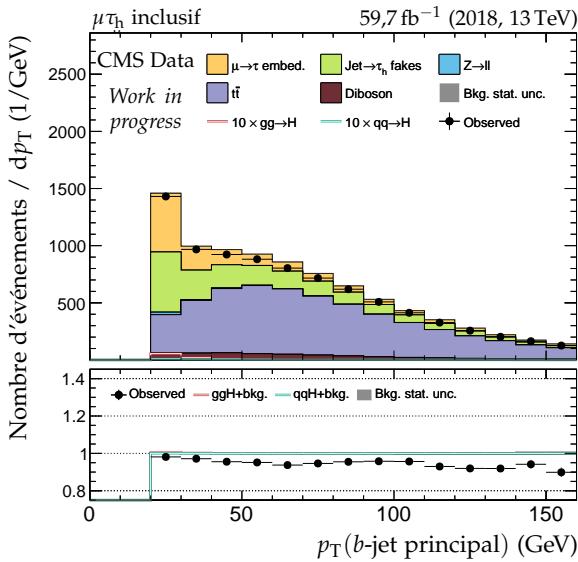
(a) Impulsion transverse du système di- τ .(b) Distance ΔR entre les leptons ($\tau_h^{(1)}, \tau_h^{(2)}$).(c) Masse visible du système di- τ .

(d) Impulsion transverse du dilepton.

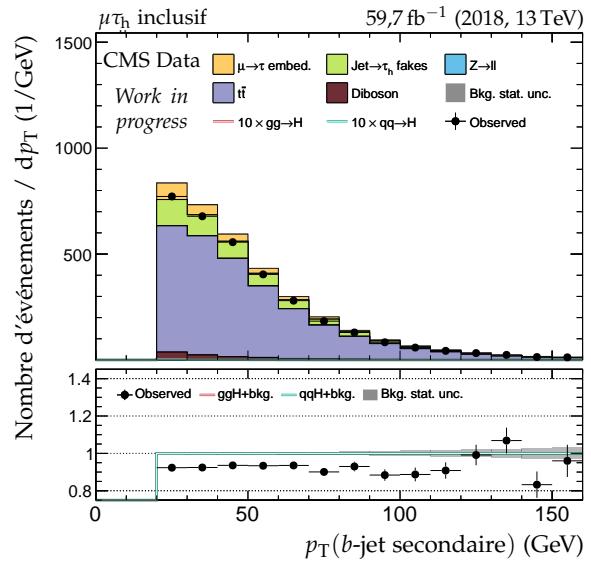
(e) Masse du système di- τ d'après SVFIT.

(f) Énergie transverse manquante.

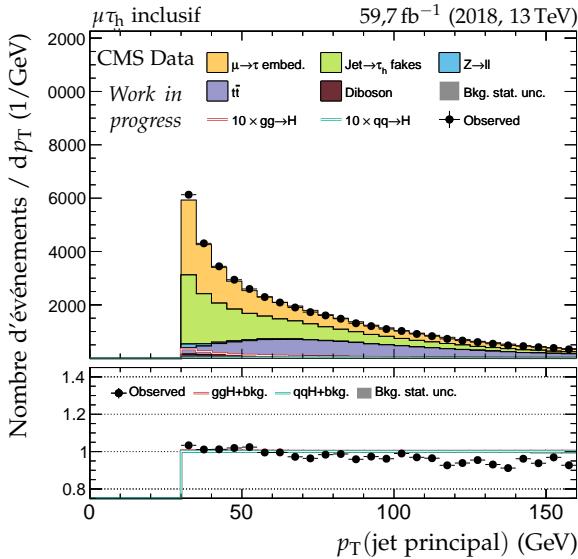
Figure X.45 – Distributions de contrôle pour le canal $\tau_h \tau_h$ en 2018 : dilepton et énergie transverse manquante.



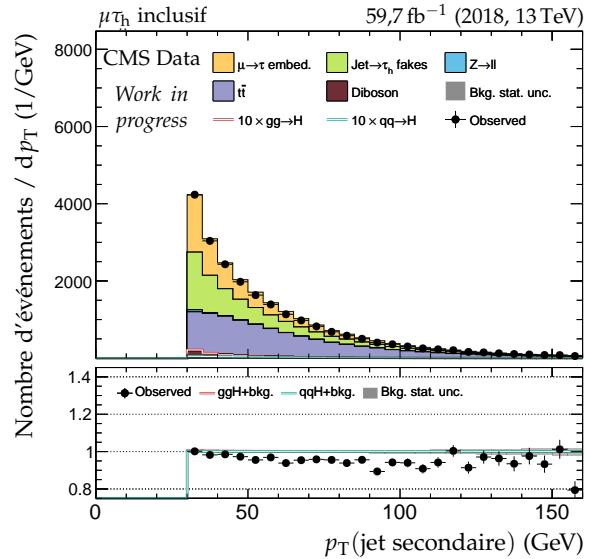
(a) Impulsion transverse du b-jet principal.



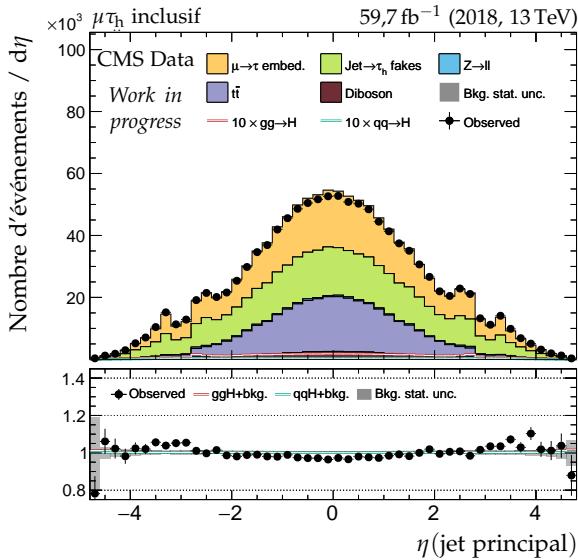
(b) Impulsion transverse du b-jet secondaire.



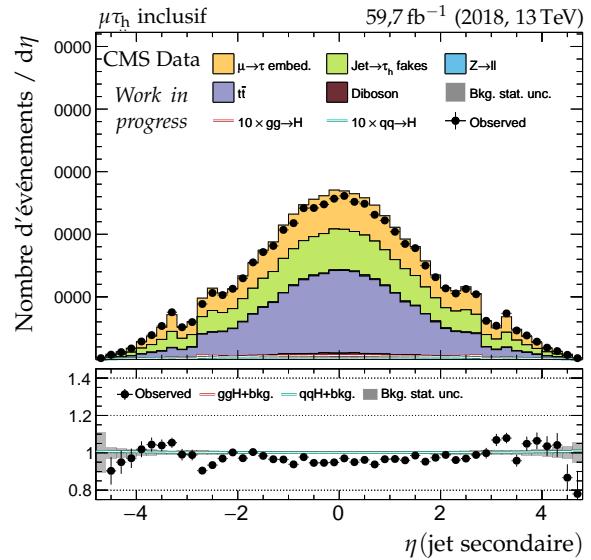
(c) Impulsion transverse du jet principal.



(d) Impulsion transverse du jet secondaire.



(e) Pseudo-rapidité du jet principal.



(f) Pseudo-rapidité du jet secondaire.

Figure X.46 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2018 : cinématique des jets.

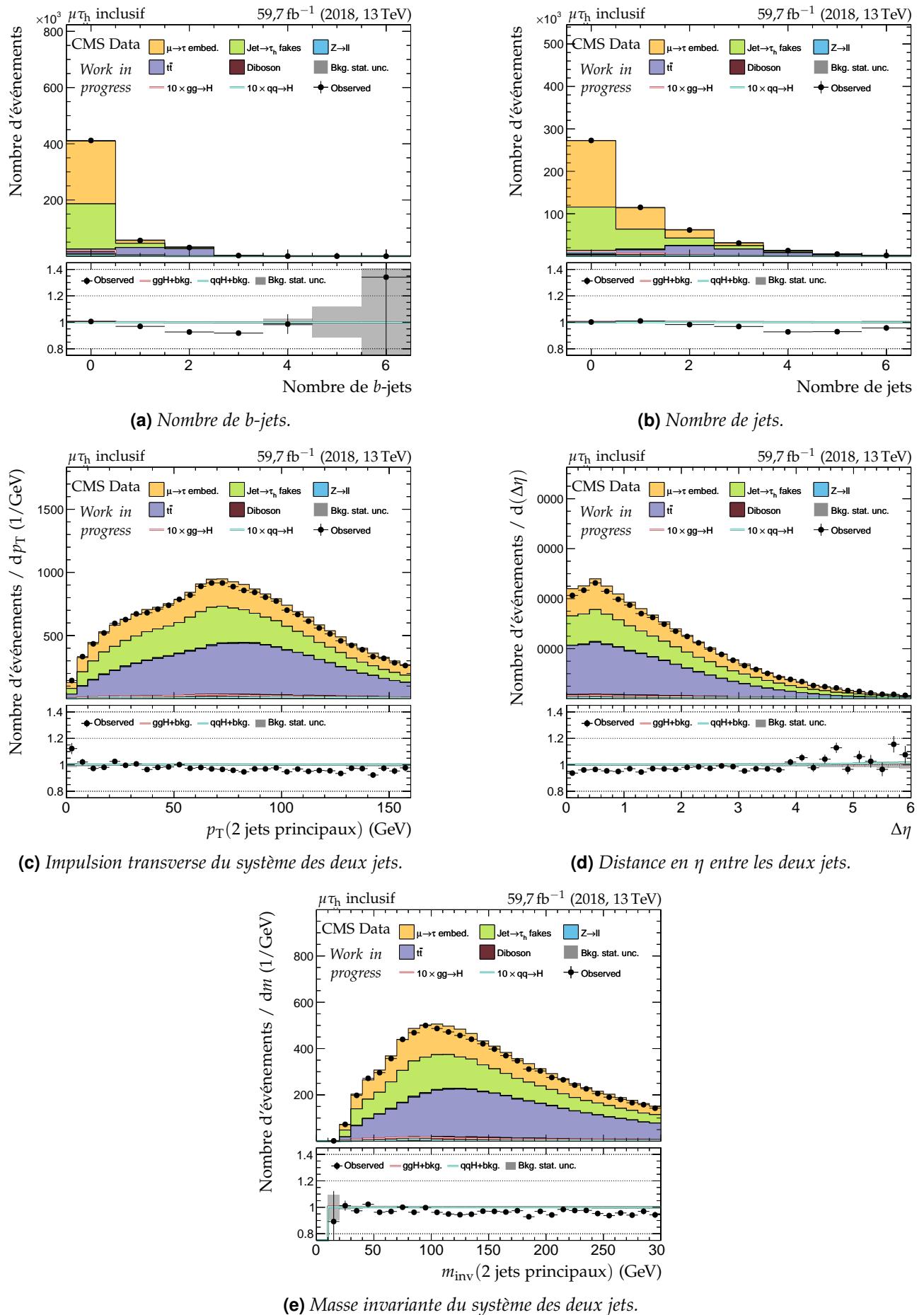


Figure X.47 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2018 : nombre de jets et système des deux jets principaux.

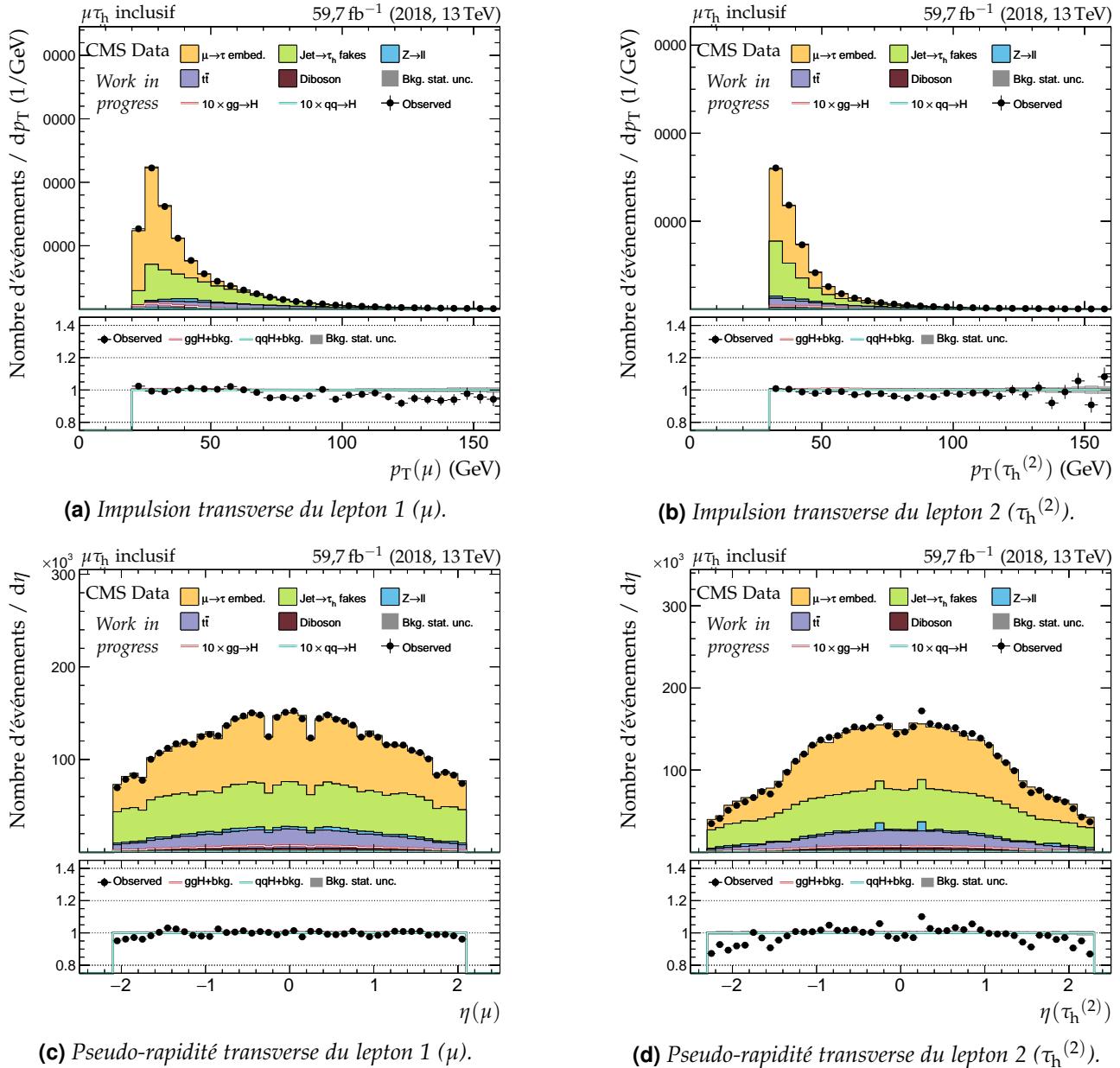


Figure X.48 – Distributions de contrôle pour le canal $\mu \tau_h$ en 2018 : cinématique des leptons ($\mu, \tau_h^{(2)}$).

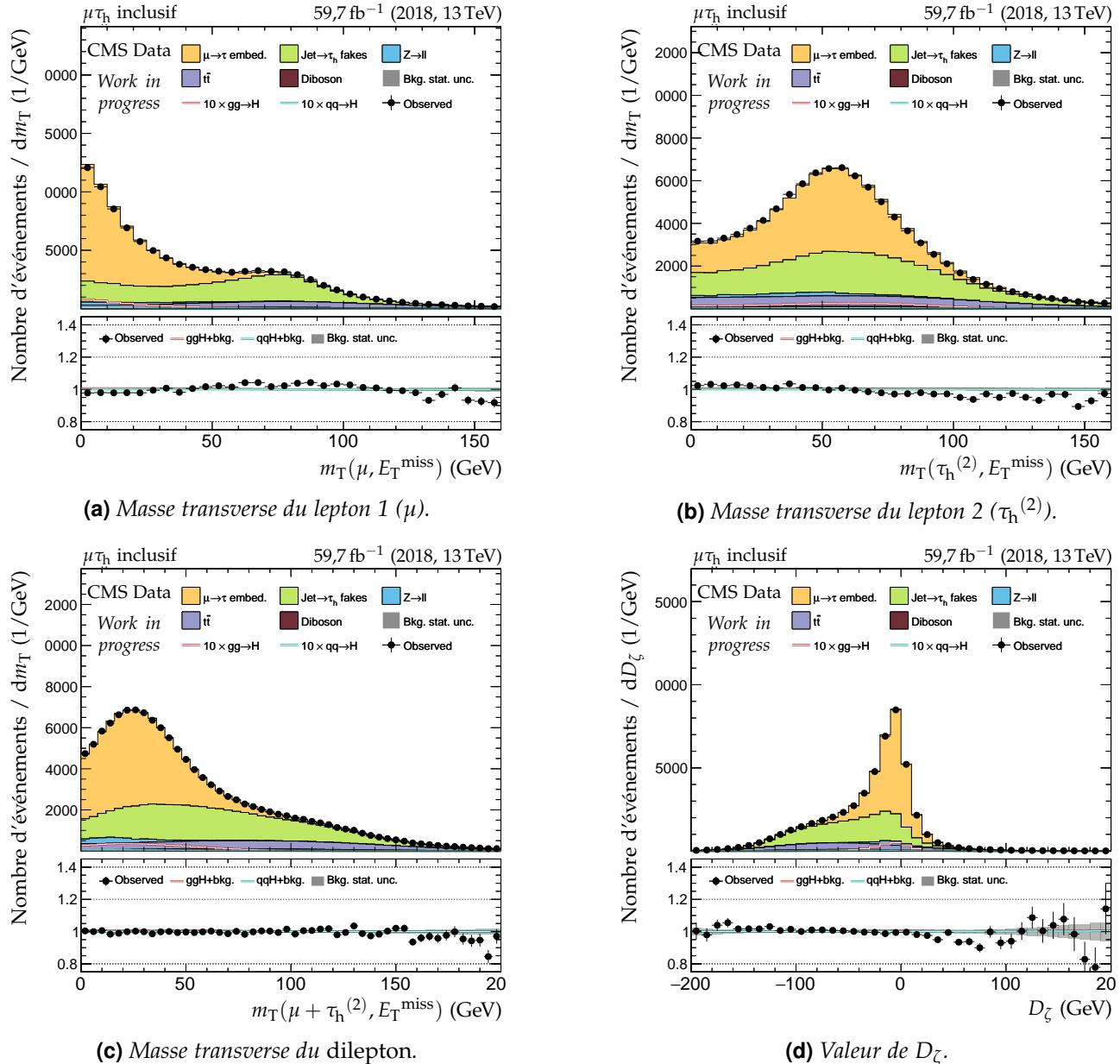
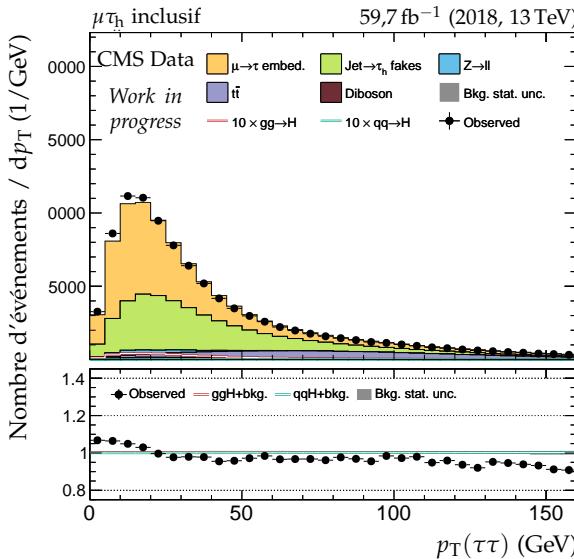
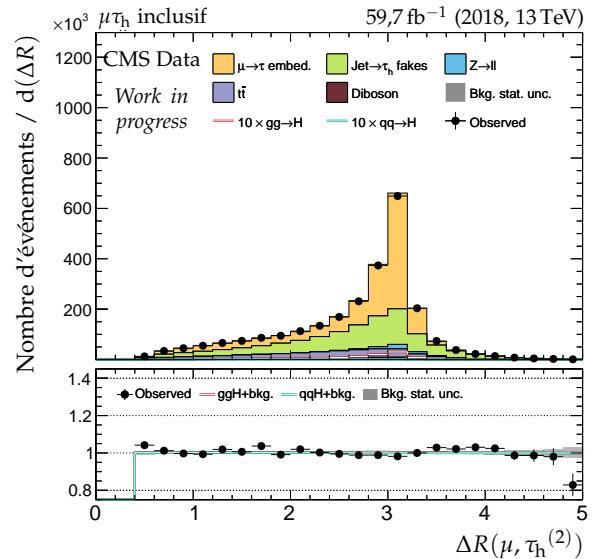
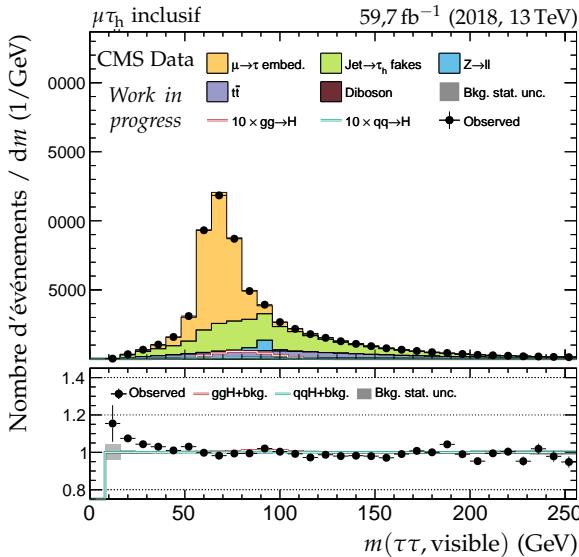
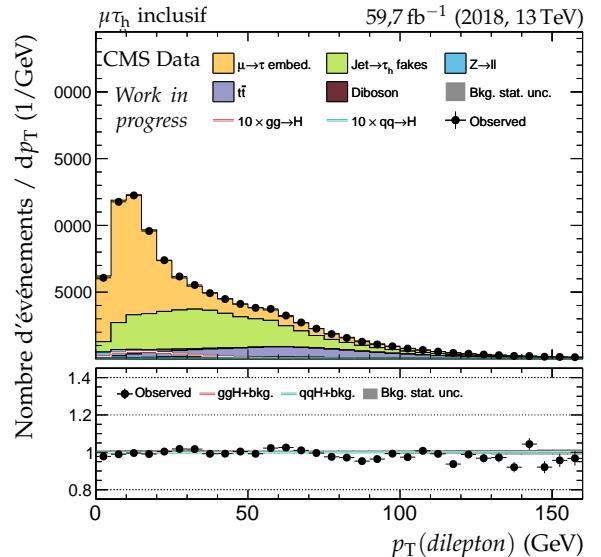
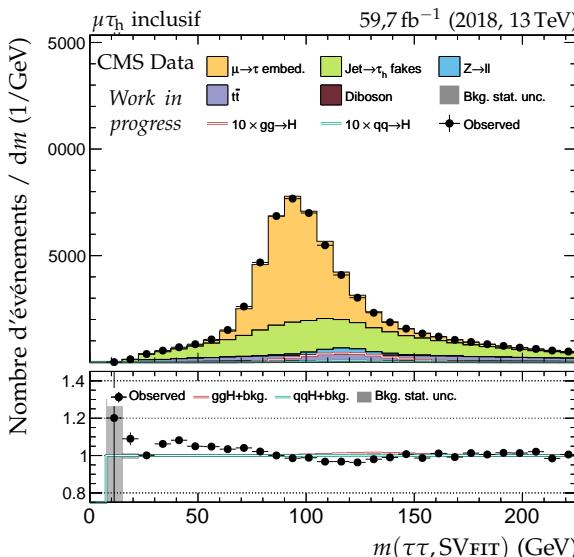
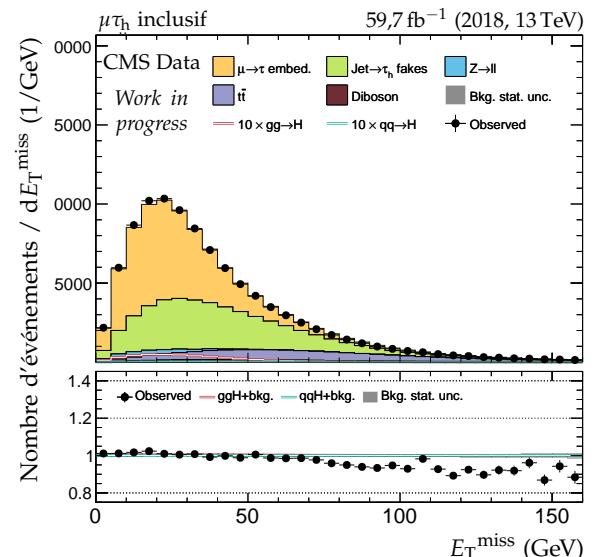


Figure X.49 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2018 : masses transverses et D_ζ .

(a) Impulsion transverse du système di- τ .(b) Distance ΔR entre les leptons ($\mu, \tau_h^{(2)}$).(c) Masse visible du système di- τ .

(d) Impulsion transverse du dilepton.

(e) Masse du système di- τ d'après SVFIT.

(f) Énergie transverse manquante.

Figure X.50 – Distributions de contrôle pour le canal $\mu\tau_h$ en 2018 : dilepton et énergie transverse manquante.

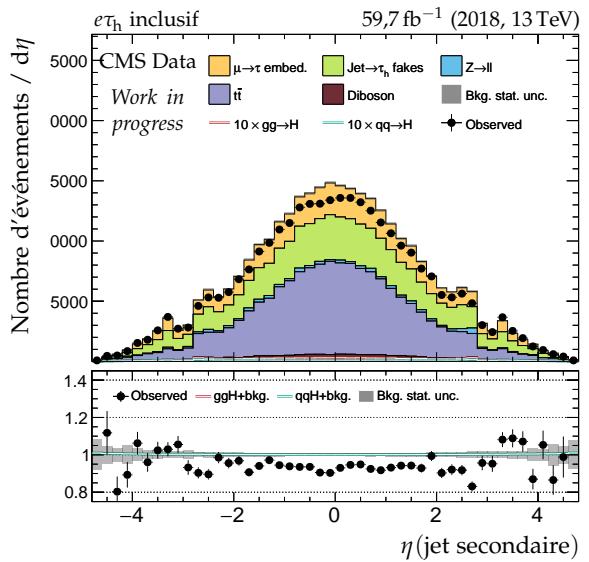
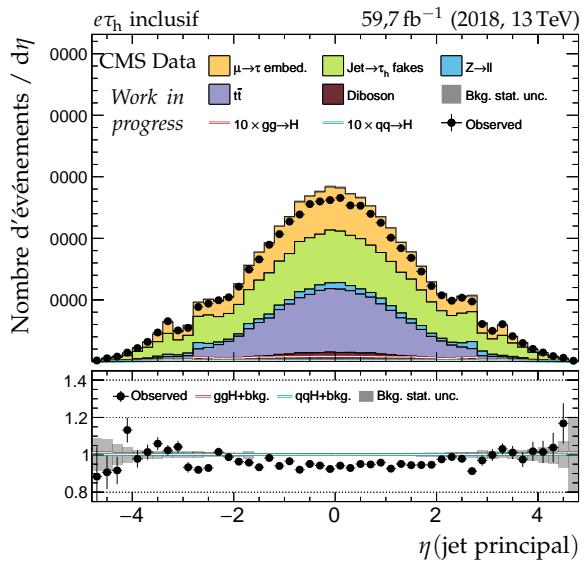
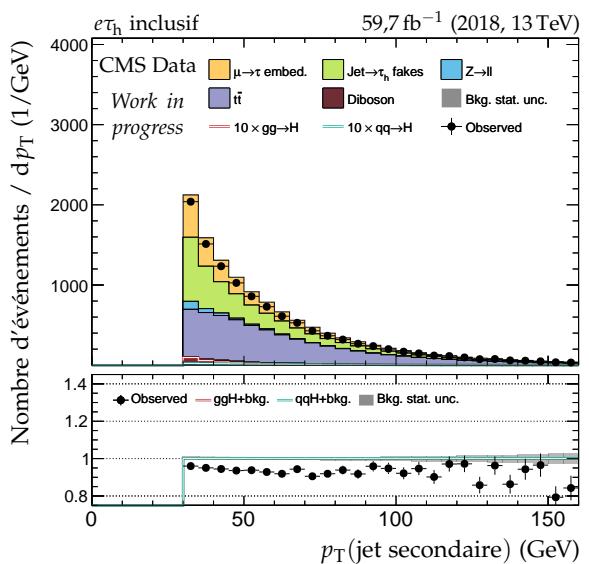
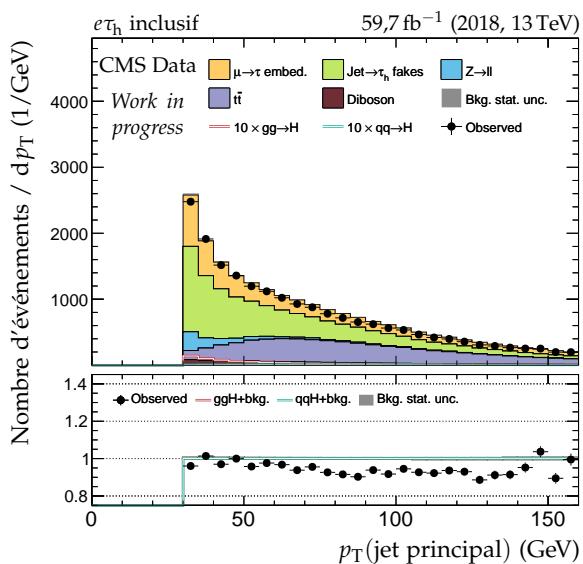
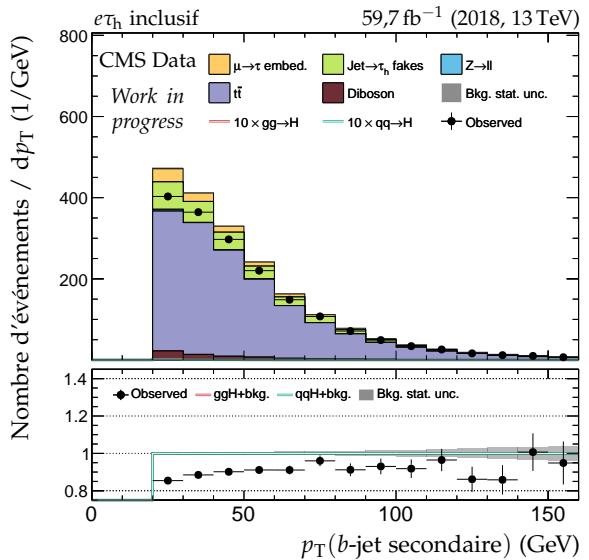
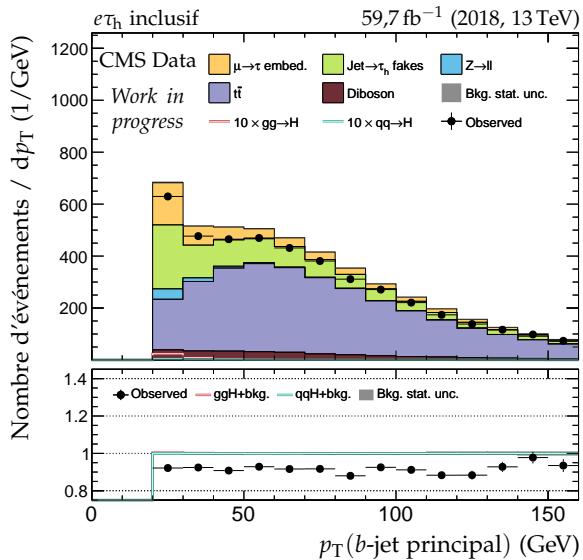


Figure X.51 – Distributions de contrôle pour le canal $e\tau_h$ en 2018 : cinématique des jets.

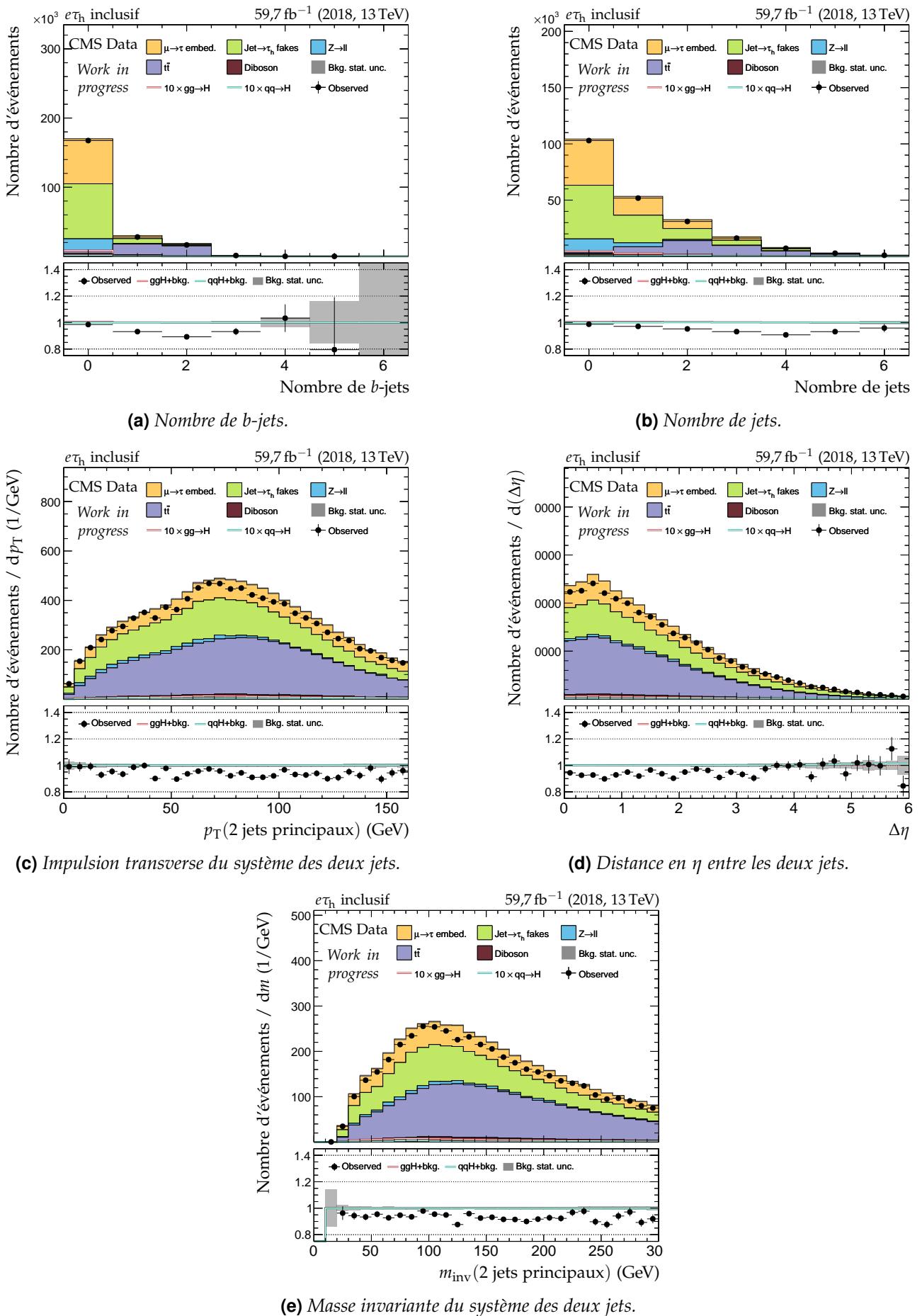
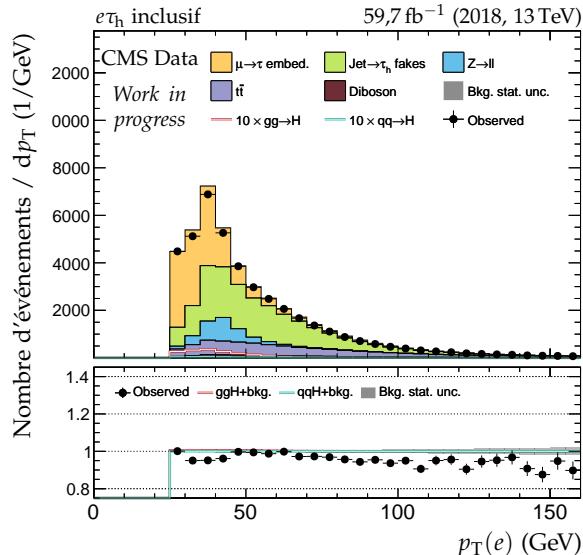
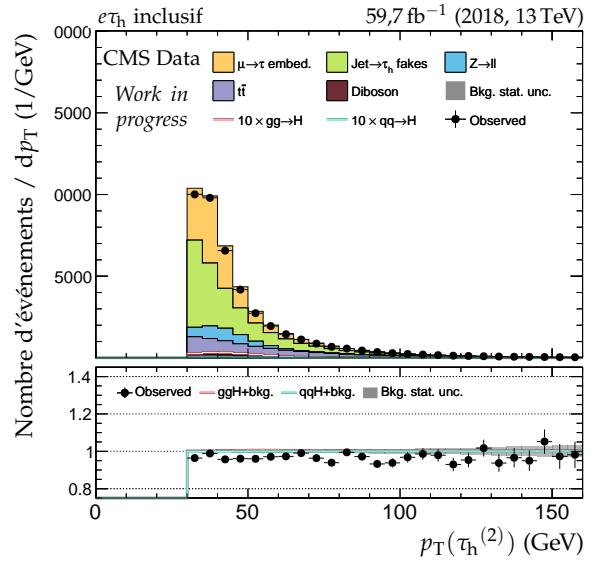
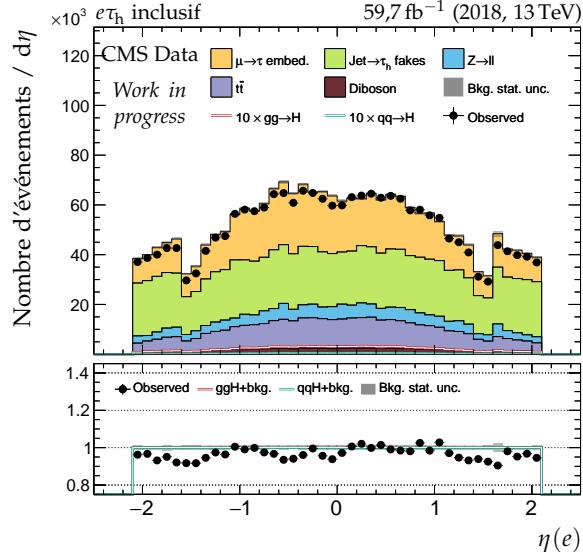
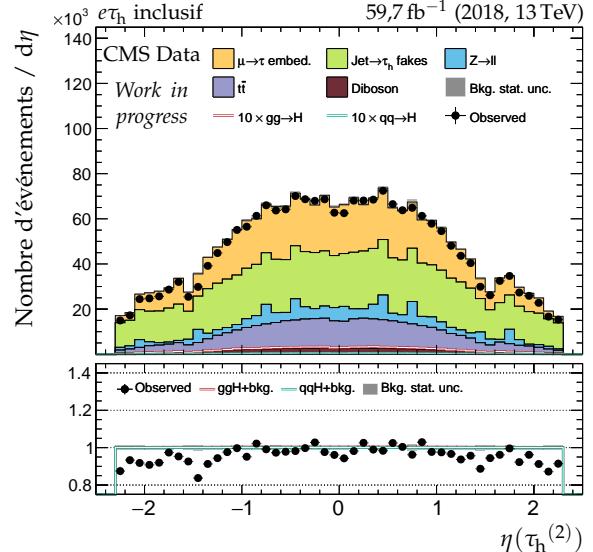


Figure X.52 – Distributions de contrôle pour le canal $e\tau_h$ en 2018 : nombre de jets et système des deux jets principaux.

(a) Impulsion transverse du lepton 1 (e).(b) Impulsion transverse du lepton 2 ($\tau_h^{(2)}$).(c) Pseudo-rapidité transverse du lepton 1 (e).(d) Pseudo-rapidité transverse du lepton 2 ($\tau_h^{(2)}$).**Figure X.53** – Distributions de contrôle pour le canal $e\tau_h$ en 2018 : cinématique des leptons ($e, \tau_h^{(2)}$).

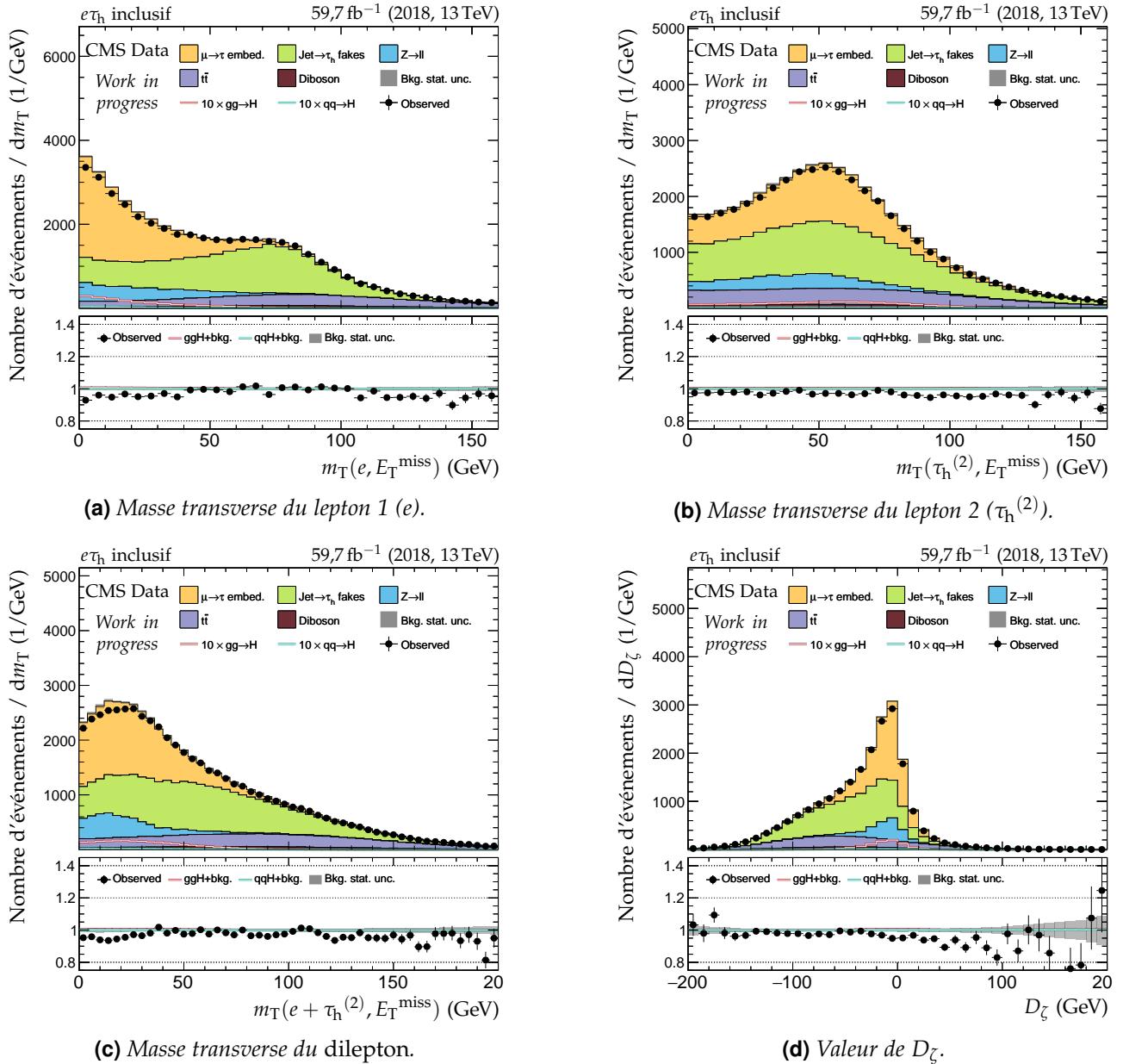
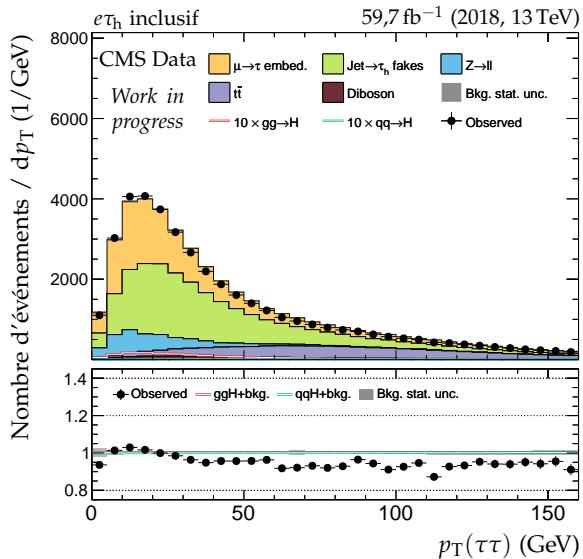
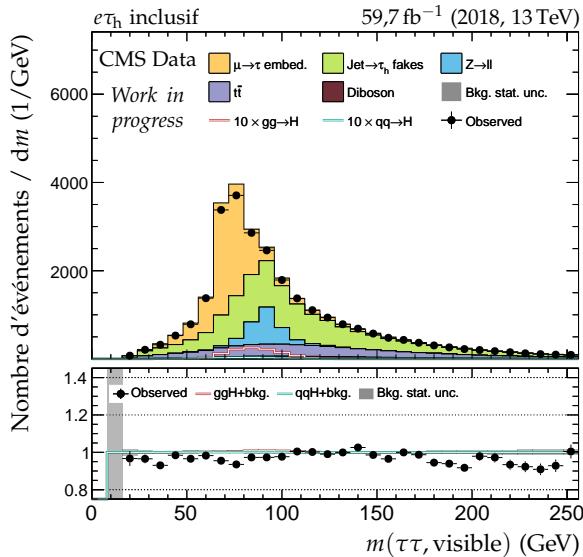
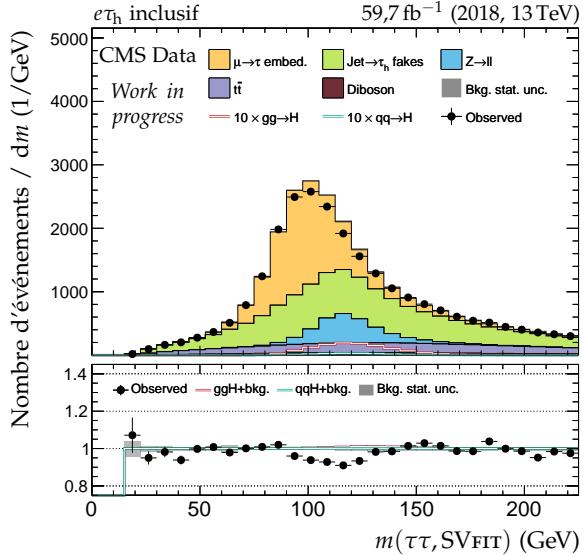
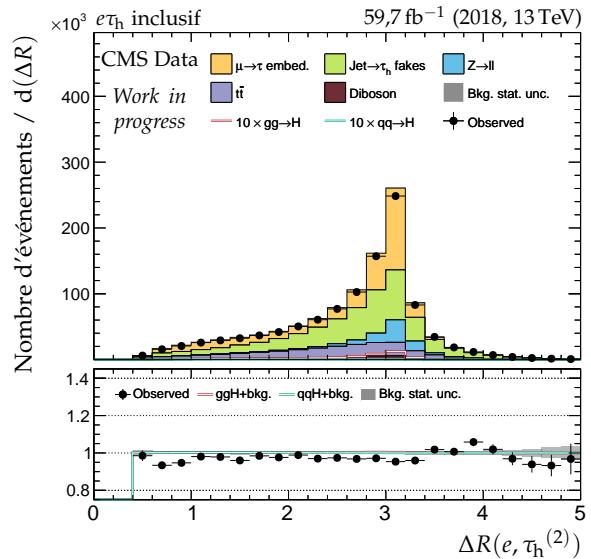
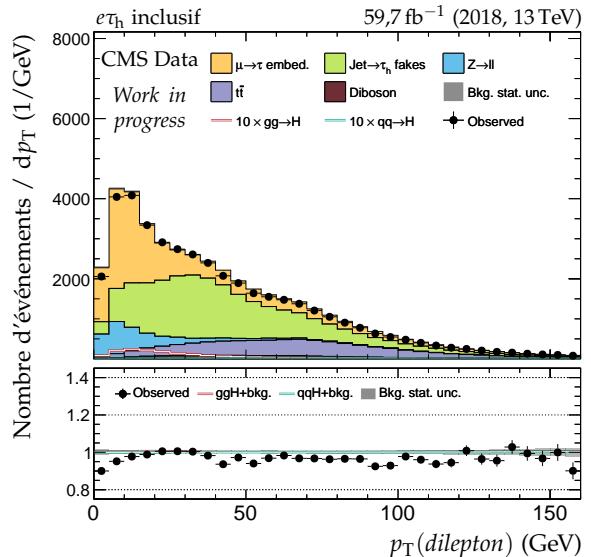
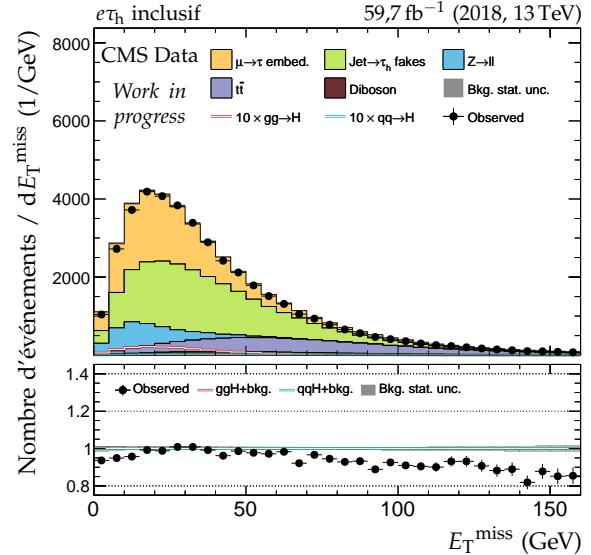


Figure X.54 – Distributions de contrôle pour le canal $e\tau_h$ en 2018 : masses transverses et D_ζ .

(a) Impulsion transverse du système di- τ .(c) Masse visible du système di- τ .(e) Masse du système di- τ d'après SVFIT.(b) Distance ΔR entre les leptons ($e, \tau_h^{(2)}$).

(d) Impulsion transverse du dilepton.



(f) Énergie transverse manquante.

Figure X.55 – Distributions de contrôle pour le canal $e\tau_h$ en 2018 : dilepton et énergie transverse manquante.

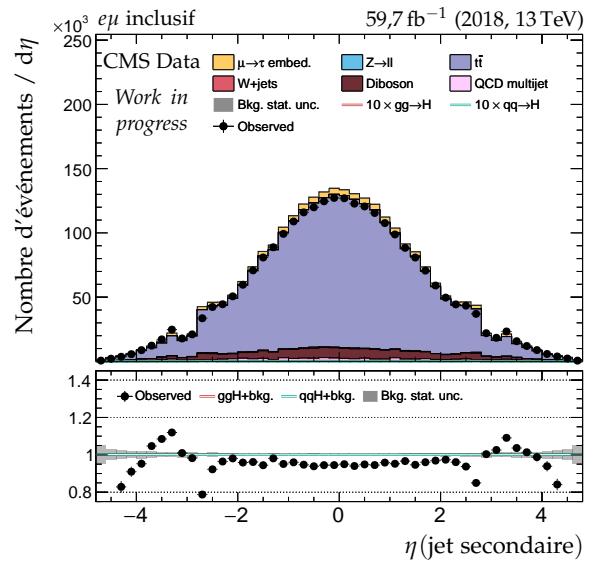
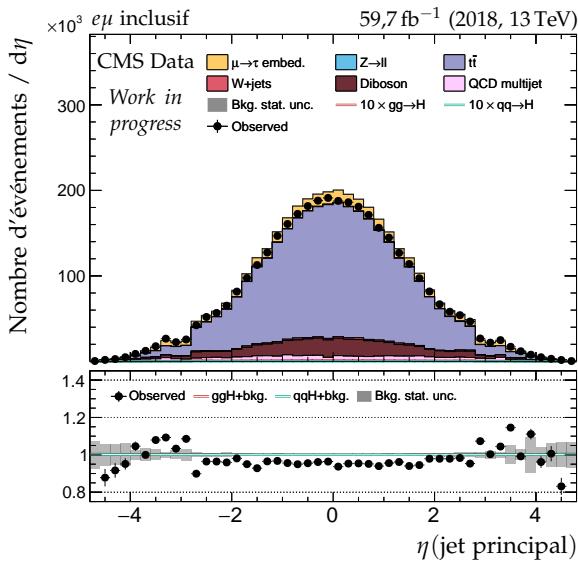
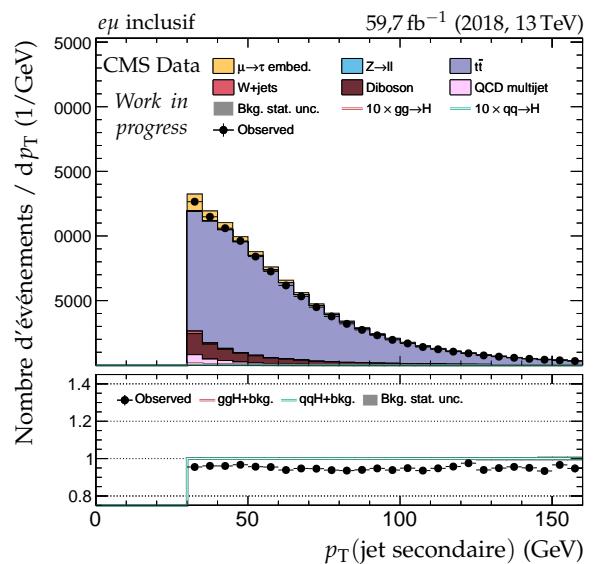
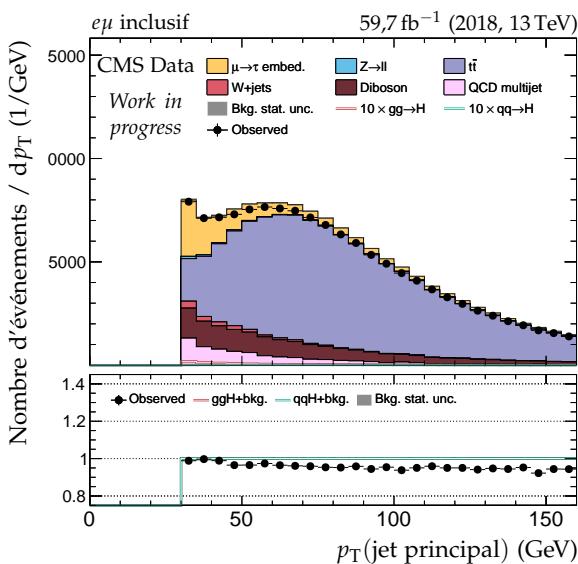
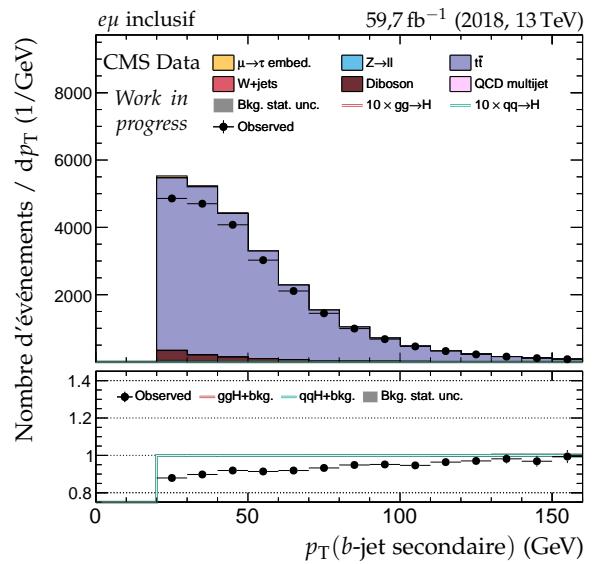
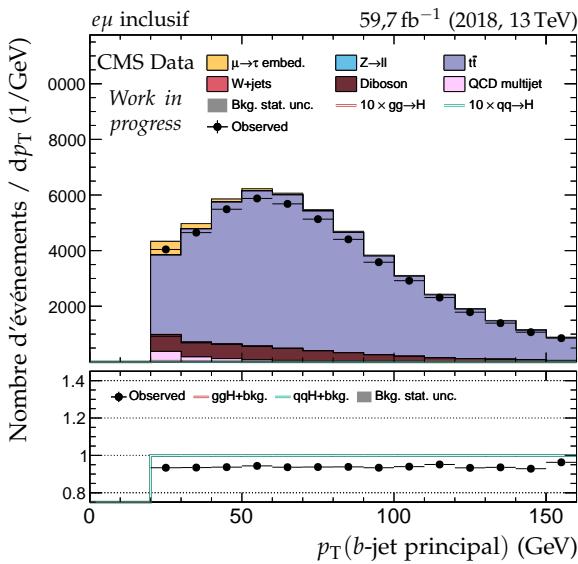


Figure X.56 – Distributions de contrôle pour le canal $e\mu$ en 2018 : cinématique des jets.

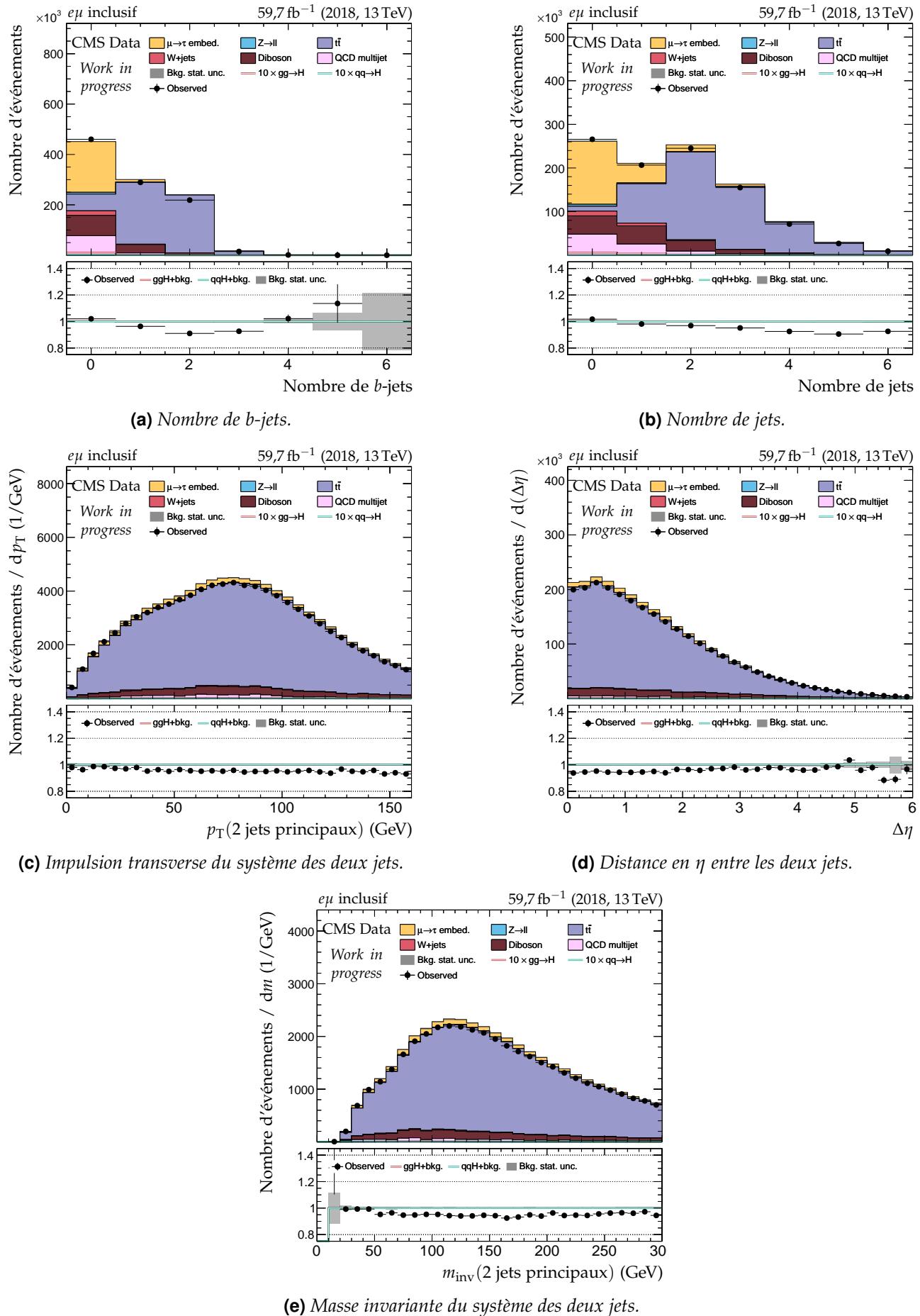


Figure X.57 – Distributions de contrôle pour le canal $e\mu$ en 2018 : nombre de jets et système des deux jets principaux.

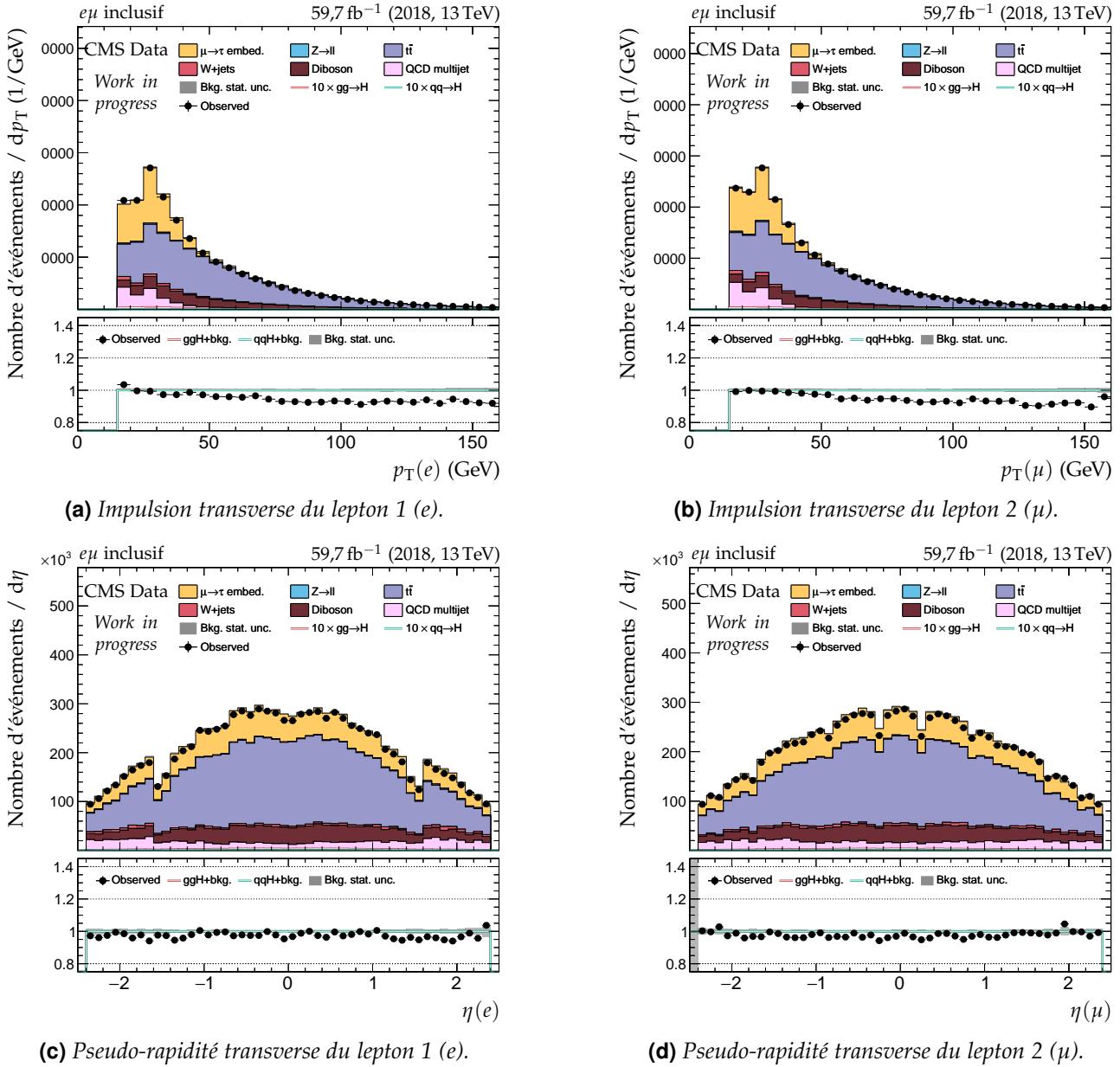
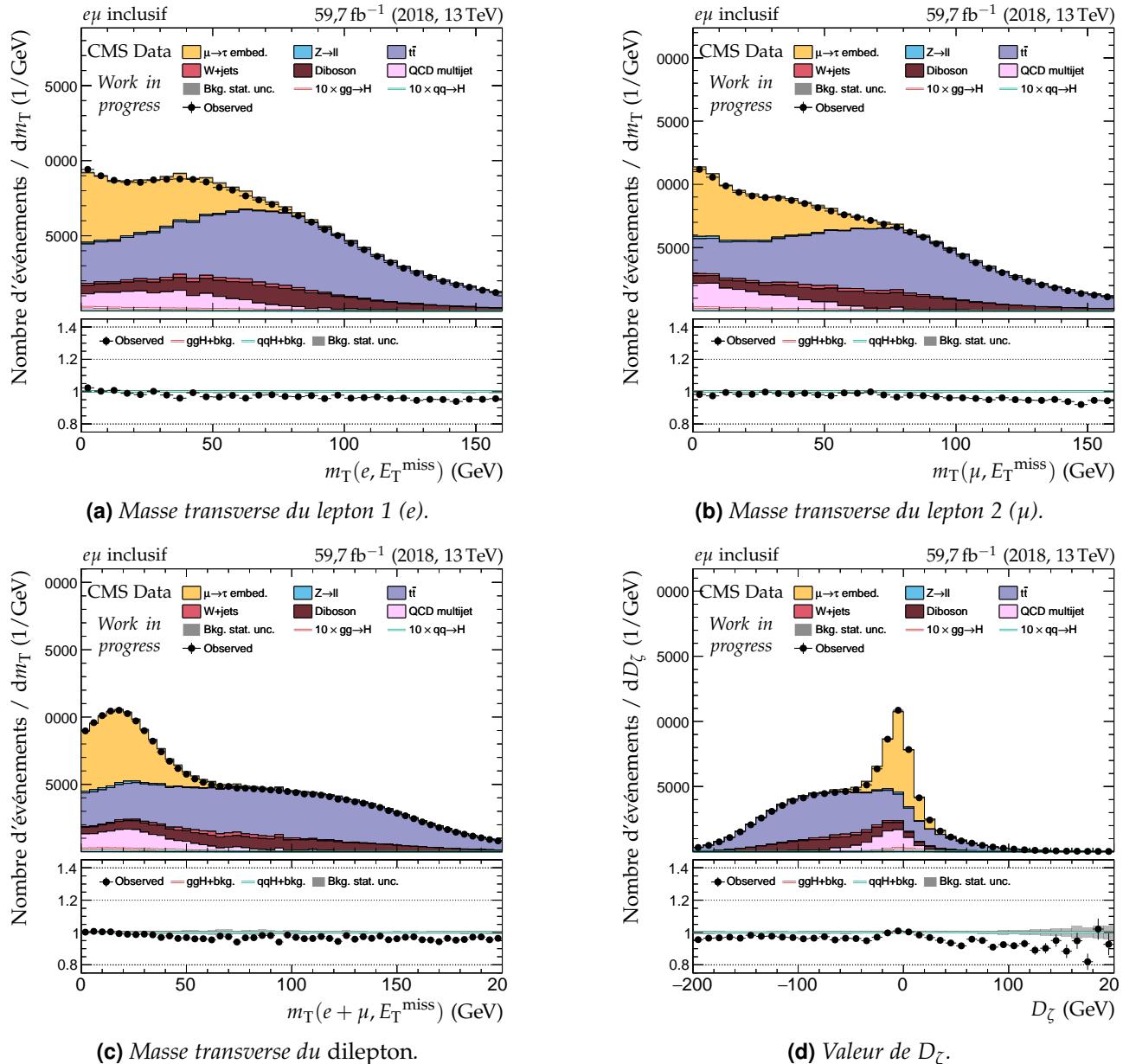


Figure X.58 – Distributions de contrôle pour le canal $e\mu$ en 2018 : cinématique des leptons (e, μ).



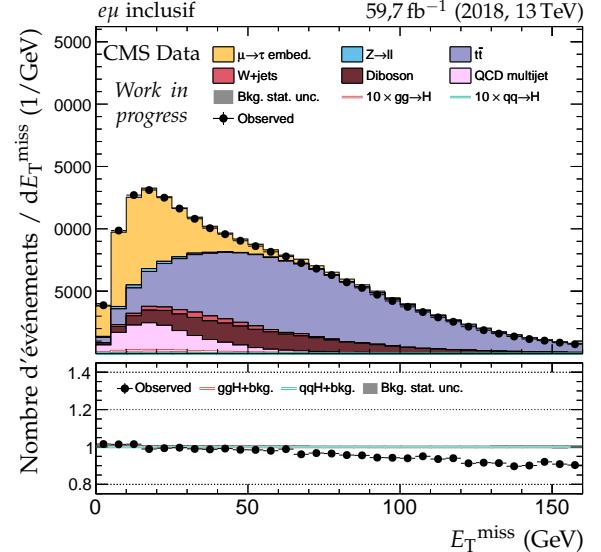
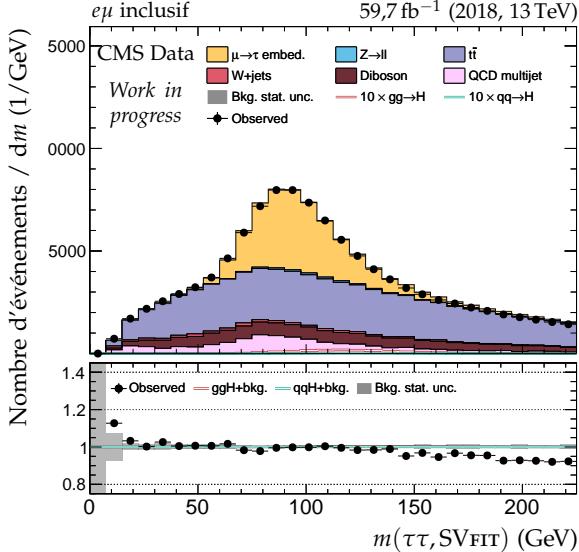
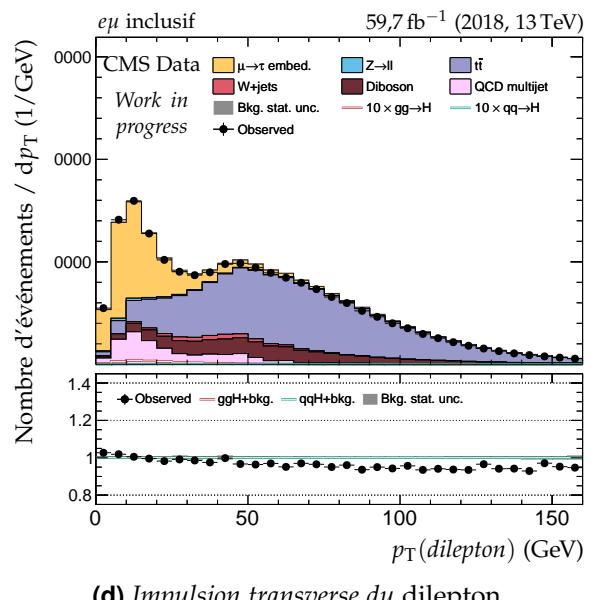
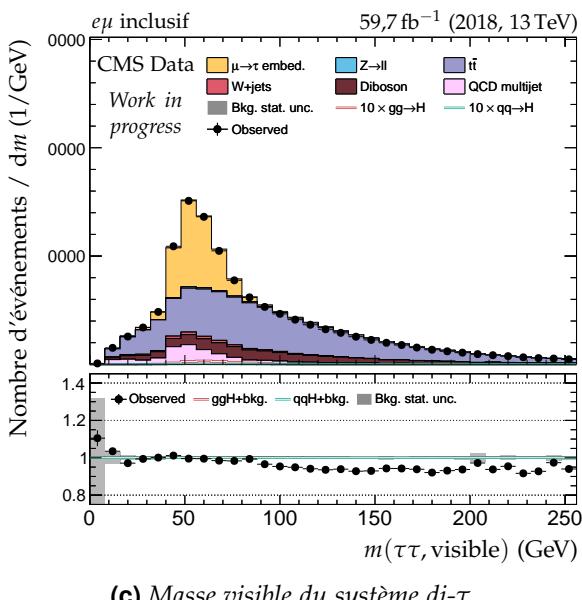
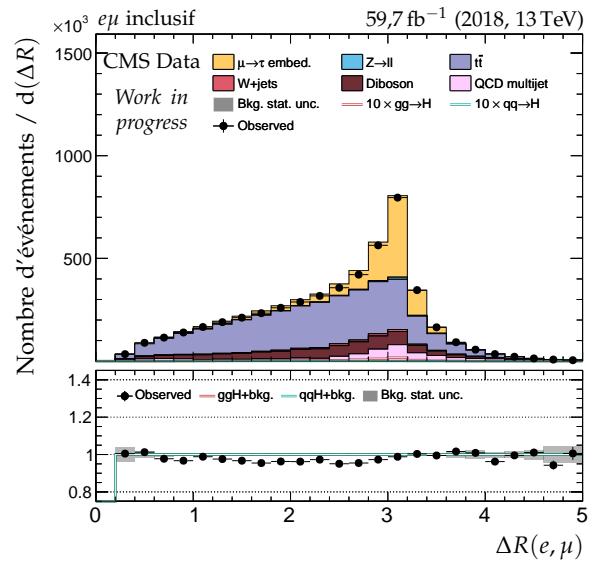
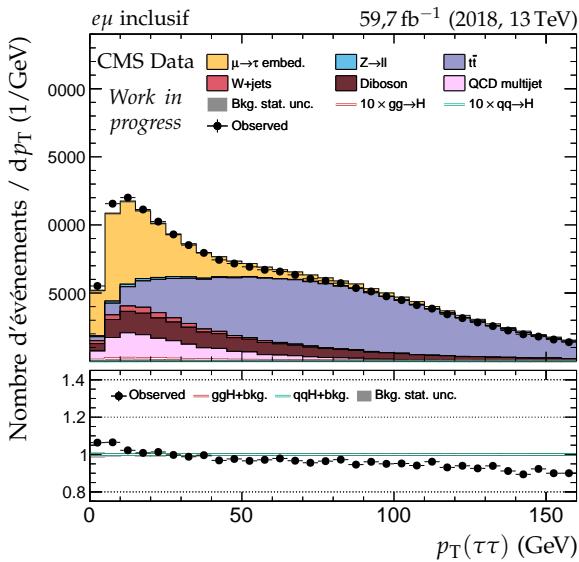


Figure X.60 – Distributions de contrôle pour le canal $e\mu$ en 2018 : dilepton et énergie transverse manquante.

