Annexe X Chemins de déclenchement – H ightarrow au au

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HLT Path	L1 Seed	Tau filter to match
HLT_VLooseIsoPFTau	L1_SingleTau100er	hltPFTau120TrackPt50LooseAbsOrRelVLooseIso
120_Trk50_eta2p1_v		
HLT_VLooseIsoPFTau	L1_SingleTau100er	hltPFTau140TrackPt50LooseAbsOrRelVLooseIso
140_Trk50_eta2p1_v		
HLT_DoubleMedium	L1_DoubleIso	hltDoublePFTau35TrackPt1MediumIsolationDz02Reg
Iso_PFTau35_Trk1	Tau*er, * in 26, 27,	
_eta2p1_Reg_v	28, 30, 32, 39	
HLT_DoubleMedium	L1_DoubleIso	hltDoublePFTau35TrackPt1MediumCombinedIsolationDz02Reg
CombinedIsoPFTau	Tau*er, * in 26, 27,	
35Trk1_eta2p1_Reg_v	28, 30, 32, 39	

Tableau X.1 – Chemins de déclenchement utilisés en 2016 pour le canal $\tau_h \tau_h$.

TITED 4	T 1 0 1	3.6 (21, , , 1	TT (*1) 1
HLT Path	L1 Seed	Muon filter to match	Tau filter to match
HLT_IsoMu22_v	L1_SingleMu20	hltL3crIsoL1sMu20L1f0L2f10Q	-
		L3f22QL3trkIsoFiltered0p09	
HLT_IsoMu22	L1_SingleMu20er	hltL3crIsoL1sSingleMu20er	-
_eta2p1_v	0	L1f0L2f10QL3f22QL3trkIso	
_cp 1		Filtered0p09	
HLT_VLooseIso	L1_SingleTau100er	-	hltPFTau120TrackPt50LooseAbs
PFTau120 Trk50	O		OrRelVLooseIso
_eta2p1_v			
HLT_VLooseIso	L1_SingleTau100er	-	hltPFTau140TrackPt50LooseAbs
PFTau140_Trk50	· ·		OrRelVLooseIso
_eta2p1_v			
HLT_IsoMu19	L1_Mu18er	hltL3crIsoL1sMu18er	hltPFTau20TrackLooseIso
_eta2p1_LooseIso	Tau20er	TauJet20erL1f0L2f10Q	AgainstMuonhltOverlapFilter
PFTau20 v	_	L3f19OL3trkIsoFiltered	IsoMu19LooseIsoPFTau20
1114420_1		0p09hltOverlapFilter	1501/1417/2005(1501114420
		IsoMu19LooseIsoPFTau20	
HLT_IsoMu19	I 1 CinalaMu19an		hltDETay20TrackI accolso Against
	L1_SingleMu18er	hltL3crIsoL1sSingleMu18erIor	hltPFTau20TrackLooseIsoAgainst
_eta2p1_LooseIso	or	SingleMu20erL1f0L2f10Q	MuonhltOverlapFilterSingleIso
PFTau20 _Sin-	L1_SingleMu20er	L3f19QL3trkIsoFiltered0p09	Mu19LooseIsoPFTau20
gleL1_v		hltOverlapFilterSingleIsoMu19	
		LooseIsoPFTau20	

Tableau X.2 – Chemins de déclenchement utilisés en 2016 pour le canal $\mu\tau_h$.

HLT Path	L1 Seed	Electron filter to match	Tau filter to match
HLT_Ele25_eta2p1 _WPTight_Gsf_v	L1_SingleEG40 or SingleIsoEG24er or L1_SingleIso EG22er	hltEle25erWPTightGsfTrack Iso- Filter	-
HLT_VLooseIso PFTau120_Trk50 _eta2p1_v	L1_SingleTau100er	-	hltPFTau120TrackPt50LooseAbs OrRelVLooseIso
HLT_VLooseIso PFTau140_Trk50 _eta2p1_v	L1_SingleTau100er	-	hltPFTau140TrackPt50LooseAbs OrRelVLooseIso
HLT_Ele24_eta2p1 _WPLoose_Gsf _LooseIsoPF- Tau20 _Sin- gleL1_v	L1_SingleEG40 or SingleIsoEG24er or L1_SingleIso EG22er	Run < 276215 and MC hltEle24WPLooseL1SingleIsoEG 22erGsfTrackIsoFilterhltOverlap FilterSingleIsoEle24WPLoose GsfLooseIsoPFTau20	hltPFTau20TrackLooseIso hl- tOverlapFilterSingleIsoEle24 WPLooseGsfLooseIsoPFTau20
HLT_Ele24_eta2p1 _WPLoose_Gsf _LooseIsoPF- Tau20_v	L1_IsoEG22er _Tau20er_dEta _Min0p2	276215 ≤ Run < 278270 hltEle24WPLooseL1IsoEG22er Tau20erGsfTrackIsoFilter hltO- verlapFilterIsoEle24 WPLooseG- sfLooseIsoPFTau20	hltPFTau20TrackLooseIso hltOverlapFilterIsoEle24 WPLooseGsfLooseIsoPFTau20
HLT_Ele24_Eta2p1 _WPLoose_Gsf _LooseIsoPF- Tau30_v	L1_IsoEG22er_Iso Tau26er_dEta _Min0p2	278270 ≤ Run hltEle24WPLooseL1IsoEG22er IsoTau26erGsfTrackIsoFilter hl- tOverlapFilterIsoEle24 WPLoo- seGsfLooseIsoPFTau30	hltPFTau30TrackLooseIso hltOverlapFilterIsoEle24 WPLooseGsfLooseIsoPFTau30

Tableau X.3 – Chemins de déclenchement utilisés en 2016 pour le canal $e\tau_h$.

HLT Path L1 Seed	Muon filter to match	Electron filter to match
	Runs B-F and MC	
HLT_Mu23_TrkIsoVVII1_Mu12_EG10	hltMu23TrkIsoVVLEle12CaloIdL	hltMu23TrkIsoVVLEle12CaloIdL
_Ele12_CaloIdL	TrackIdLIsoVLMuon	TrackIdLIsoVLElectronlegTrack
_Tra-	legL3IsoFiltered23	IsoFilter
ckIdL_IsoVL_v		
HLT_Mu8_TrkIsoVVIL1_Mu5_EG15	hltMu8TrkIsoVVLEle23CaloIdL	hltMu8TrkIsoVVLEle23CaloIdL
_Ele23_CaloIdL	TrackIdLIsoVLMuon	TrackIdLIsoVLElectronlegTrack
_Tra-	legL3IsoFiltered8	IsoFilter
ckIdL_IsoVL_v	_	
	Runs G-H	
HLT_Mu23_TrkIsoVVII1_Mu12_EG10	hltMu23TrkIsoVVLEle12CaloIdL	hltMu23TrkIsoVVLEle12CaloIdL
_Ele12_CaloIdL	TrackIdLIsoVLMuon	TrackIdLIsoVLElectron
_TrackIdL	legL3IsoFiltered23 and	legTrackIsoFilter and
_IsoVL_DZ_v	hltMu23TrkIsoVVLEle12CaloIdL	hltMu23TrkIsoVVLEle12CaloIdL
	TrackIdLIsoVLDZFilter	TrackIdLIsoVLDZFilter
HLT_Mu8_TrkIsoVVIL1_Mu5_EG15	hltMu8TrkIsoVVLEle23CaloIdL	hltMu8TrkIsoVVLEle23CaloIdL
_Ele23_CaloIdL	TrackIdLIsoVLMuon	TrackIdLIsoVLElectron
_TrackIdL	legL3IsoFiltered8 and	legTrackIsoFilter and
_IsoVL_DZ_v	hltMu8TrkIsoVVLEle23CaloIdL	hltMu8TrkIsoVVLEle23CaloIdL
	TrackIdLIsoVLDZFilter	TrackIdLIsoVLDZFilter

Tableau X.4 – Chemins de déclenchement utilisés en 2016 pour le canal e μ .

THED (T 1 C 1	
HLT Path	L1 Seed	Tau filter to match
HLT_MediumCharged	L1_SingleTau80	hltPFTau180TrackPt50LooseAbsOrRelMediumHighPtRelaxed
IsoPFTau180High	to140er	IsoIso and hltSelectedPFTau180MediumChargedIsolation
PtRelaxedIso_Trk50		L1HLTMatched
_eta2p1_v		
HLT_DoubleMedium	L1_DoubleIsoTau	hltDoublePFTau40TrackPt1MediumChargedIsolationAndTight
ChargedIsoPFTau	*er2p1, * in 28, 30,	OOSCPhotonsDz02Reg
40_Trk1_TightID	32, 33, 34, 35, 36,	-
_eta2p1_Reg_v	38, 70	
HLT_DoubleTight	L1_DoubleIsoTau	hltDoublePFTau40TrackPt1TightChargedIsolationDz02Reg
ChargedIsoPFTau40	*er2p1, * in 28, 30,	
_Trk1_eta2p1_Reg_v	32, 33, 34, 35, 36,	
	38, 70	
HLT_DoubleTight	L1_DoubleIsoTau	hltDoublePFTau35TrackPt1TightChargedIsolationAndTight
ChargedIsoPFTau	*er2p1, * in 28, 30,	OOSCPhotonsDz02Reg
35_Trk1_TightID	32, 33, 34, 35, 36,	
_eta2p1_Reg_v	38, 70	

Tableau X.5 – Chemins de déclenchement utilisés en 2017 pour le canal $\tau_h \tau_h$.

HLT Path	L1 Seed	Muon filter to match	Tau filter to match
HLT_IsoMu24_v	L1_SingleMu22	hltL3crIsoL1sSingleMu22L1f0L2	-
		f10QL3f24QL3trkIsoFiltered0p07	
HLT_IsoMu27_v	L1_SingleMu22 or	hltL3crIsoL1sMu22Or25L1f0L2	-
	L1_SingleMu25	f10QL3f27QL3trkIsoFiltered0p07	
HLT_Medium	L1_SingleTau80	-	hltPFTau180TrackPt50LooseAbs
ChargedIsoPF	to140er		OrRelMediumHighPtRelaxed
Tau180HighPt			IsoIso and hltSelectedPF
RelaxedIso_Trk50			Tau180MediumChargedIsolation
_eta2p1_v			L1HLTMatched
HLT_IsoMu20	L1_Mu18er2p1	hltL3crIsoL1sMu18erTau24erIor	hltSelectedPFTau27LooseCharged
_eta2p1_Loose	_Tau24er2p1	Mu20erTau24erL1f0L2f10QL3f20Q	IsolationAgainstMuonL1HLT
ChargedIsoPF		L3trkIsoFiltered0p07hltOverlap	MatchedhltOverlapFilterIso
Tau27_eta2p1		FilterIsoMu20LooseChargedIso	Mu20LooseChargedIsoPFTau27
_CrossL1_v		PFTau27L1Seeded	L1Seeded

Tableau X.6 – Chemins de déclenchement utilisés en 2017 pour le canal $\mu\tau_h$.

HLT Path	L1 Seed	Electron filter to match	Tau filter to match
HLT_Ele27_WP	L1_SingleEGXX	hltEle27WPTightGsfTrackIsoFilter	-
Tight_Gsf_v	or L1_SingleEG		
	XXer2p1 or L1		
	_SingleIsoEGXX		
	or L1_SingleIso		
	EGXXer2p1		
HLT_Ele32_WP	L1_SingleEGXX	hltEle32WPTightGsfTrackIsoFilter	-
Tight_Gsf_v	or L1_SingleEG		
	XXer2p1 or L1		
	_SingleIsoEGXX		
	or L1_SingleIso		
	EGXXer2p1	LIVEL OF AUTOMATICAL OF ALL	
HLT_Ele35_WP	L1_SingleEGXX	hltEle35noerWPTightGsfTrackIso	-
Tight_Gsf_v	or L1_SingleEG	Filter	
	XXer2p1 or L1		
	_SingleIsoEGXX		
	or L1_SingleIso		
HLT Medium	EGXXer2p1 L1_SingleTau80		hltPFTau180TrackPt50LooseAbs
ChargedIsoPF	to140er		OrRelMediumHighPtRelaxed
Tau180HighPt	1014061		IsoIso and hltSelectedPF
RelaxedIso_Trk50			Tau180MediumChargedIsolation
_eta2p1_v			L1HLTMatched
HLT_Ele24_eta2p1	L1 LooseIsoEG22er	hltEle24erWPTightGsfTrack Iso-	hltSelectedPFTau30LooseCharged
_WPTight_Gsf		FilterForTauhltOverlap FilterI-	IsolationL1HLTMatchedhlt
_LooseChar-	_dR_Min0p3	soEle24WPTightGsf LooseIsoPF-	OverlapFilterIsoEle24WPTight
gedIso PF-	- 1	Tau30	GsfLooseIsoPFTau30
Tau30_eta2p1			
_CrossL1_v			

Tableau X.7 – Chemins de déclenchement utilisés en 2017 pour le canal $e\tau_h$.

HLT Path	L1 Seed	Muon filter to match	Electron filter to match
HLT_Mu23_TrkIso	???	hltMu23TrkIsoVVLEle12CaloIdL	hltMu23TrkIsoVVLEle12CaloIdL
VVL_Ele12_CaloIdL		TrackIdLIsoVLMuonlegL3Iso	TrackIdLIsoVLElectronlegTrack
_Tra-		Filtered23	IsoFilter
ckIdL_IsoVL_DZ			
HLT_Mu8_TrkIso	???	hltL3fL1sMu7EG23f0Filtered8	hltMu8TrkIsoVVLEle23CaloIdL
VVL_Ele23_CaloIdL		or hltMu8TrkIsoVVLEle23Calo	TrackIdLIsoVLElectronleg
_Tra-		IdLTrackIdLIsoVLMuonlegL3	TrackIsoFilter
ckIdL_IsoVL_DZ		IsoFiltered8	

Tableau X.8 – Chemins de déclenchement utilisés en 2017 pour le canal e μ .

HLT Path	L1 Seed	Tau filter to match
HLT_MediumCharged	L1_SingleTau80	hltPFTau180TrackPt50LooseAbsOrRelMediumHighPtRelaxed
IsoPFTau180High	to140er	IsoIso and hltSelectedPFTau180MediumChargedIsolation
PtRelaxedIso_Trk50		L1HLTMatched
_eta2p1_v		
HLT_DoubleMedium	L1_DoubleIsoTau	hltDoublePFTau40TrackPt1MediumChargedIsolationAndTight
ChargedIsoPFTau	*er2p1, * in 28, 30,	OOSCPhotonsDz02Reg
40_Trk1_TightID	32, 33, 34, 35, 36,	
_eta2p1_Reg_v	38, 70	
HLT_DoubleTight	L1_DoubleIsoTau	hltDoublePFTau40TrackPt1TightChargedIsolationDz02Reg
ChargedIsoPFTau40	*er2p1, * in 28, 30,	
_Trk1_eta2p1_Reg_v	32, 33, 34, 35, 36,	
	38, 70	
HLT_DoubleTight	L1_DoubleIsoTau	hltDoublePFTau35TrackPt1TightChargedIsolationAndTight
ChargedIsoPFTau	*er2p1, * in 28, 30,	OOSCPhotonsDz02Reg
35_Trk1_TightID	32, 33, 34, 35, 36,	
_eta2p1_Reg_v	38, 70	THE DOLL DOTT AFTE LINEAU II CL. II LE
HLT_DoubleMedium	L1_DoubleIsoTau	hltHpsDoublePFTau35TrackPt1MediumChargedIsolation
ChargedIsoPFTau	*er2p1, * in 28, 30,	Dz02Reg
HPS35_Trk1_eta2p1	32, 33, 34, 35, 36,	
_Reg_v	38, 70	

Tableau X.9 – Chemins de déclenchement utilisés en 2018 pour le canal $\tau_h \tau_h$.

HLT Path	L1 Seed	Muon filter to match	Tau filter to match
HLT_IsoMu24_v	L1_SingleMu22	hltL3crIsoL1sSingleMu22L1f0L2	-
		f10QL3f24QL3trkIsoFiltered0p07	
HLT_IsoMu27_v	L1_SingleMu22 or	hltL3crIsoL1sMu22Or25L1f0L2	-
	L1_SingleMu25	f10QL3f27QL3trkIsoFiltered0p07	
HLT_Medium	L1_SingleTau80	-	hltPFTau180TrackPt50LooseAbs
ChargedIsoPF	to140er		OrRelMediumHighPtRelaxed
Tau180HighPt			IsoIso and hltSelectedPF
RelaxedIso_Trk50			Tau180MediumChargedIsolation
_eta2p1_v			L1HLTMatched
HLT_IsoMu20	L1_Mu18er2p1	hltL3crIsoL1sMu18erTau24erIor	hltSelectedPFTau27LooseCharged
_eta2p1_Loose	_Tau24er2p1	Mu20erTau24erL1f0L2f10QL3f20Q	IsolationAgainstMuonL1HLT
ChargedIsoPF	•	L3trkIsoFiltered0p07hltOverlap	MatchedhltOverlapFilterIso
Tau27_eta2p1		FilterIsoMu20LooseChargedIso	Mu20LooseChargedIsoPFTau27
_CrossL1_v		PFTau27L1Seeded	L1Seeded

Tableau X.10 – Chemins de déclenchement utilisés en 2018 pour le canal $\mu\tau_h$.

HLT Path	L1 Seed	Electron filter to match	Tau filter to match
HLT_Ele32_WP	L1_SingleEGXX	hltEle32WPTightGsfTrackIsoFilter	
Tight_Gsf_v	or L1_SingleEG	inteleozvvi iigittosi iitakisoi iitai	
116111_001_1	XXer2p1 or L1		
	_SingleIsoEGXX		
	or L1_SingleIso		
	EGXXer2p1		
HLT_Ele35_WP	L1_SingleEGXX	hltEle35noerWPTightGsfTrackIso	_
Tight_Gsf_v	or L1_SingleEG	Filter	
11811-001-1	XXer2p1 or L1	11101	
	_SingleIsoEGXX		
	or L1_SingleIso		
	EGXXer2p1		
HLT_Medium	L1_SingleTau80	-	hltPFTau180TrackPt50LooseAbs
ChargedIsoPF	to140er		OrRelMediumHighPtRelaxed
Tau180HighPt			IsoIso and hltSelectedPF
RelaxedIso_Trk50			Tau180MediumChargedIsolation
_eta2p1_v			L1HLTMatched
HLT_Ele24_eta2p1	L1_LooseIsoEG22	hltEle24erWPTightGsfTrackIso	hltSelectedPFTau30LooseCharged
_WPTight_Gsf	er2p1_IsoTau26	FilterForTauhltÖverlapFilter	IsolationL1HLTMatchedhlt
_LooseChar-	er2p1_dR_Min0p3	IsoEle24WPTightGsfLooseIso	OverlapFilterIsoEle24WPTight
gedIso PF-	•	PFTau30	GsfLooseIsoPFTau30
Tau30_eta2p1			
_CrossL1_v or			
HLT_Ele24_eta2p1			
_WP-			
Tight_Gsf_Loose			
ChargedIsoPF			
TauHPS30_eta2p1			
_CrossL1_v			

Tableau X.11 – Chemins de déclenchement utilisés en 2018 pour le canal $e\tau_h$.

HLT Path	L1 Seed	Muon filter to match	Electron filter to match
HLT_Mu23_TrkIso	???	hltMu23TrkIsoVVLEle12CaloIdL	hltMu23TrkIsoVVLEle12CaloIdL
VVL_Ele12_CaloIdL	ı	TrackIdLIsoVLMuonlegL3Iso	TrackIdLIsoVLElectronlegTrack
_Tra-		Filtered23	IsoFilter
ckIdL_IsoVL_DZ			
HLT_Mu8_TrkIso	???	hltL3fL1sMu7EG23f0Filtered8	hltMu8TrkIsoVVLEle23CaloIdL
VVL_Ele23_CaloIdL		or hltMu8TrkIsoVVLEle23CaloIdL	TrackIdLIsoVLElectronlegTrack
_Tra-		TrackIdLIsoVLMuonlegL3Iso	IsoFilter
ckIdL_IsoVL_DZ		Filtered8	

Tableau X.12 – Chemins de déclenchement utilisés en 2018 pour le canal eµ.

Table des matières

X Chemins de déclenchement – $H \to \tau \tau$

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