Description of Variables in UCSB SUSY ROOT Tree

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This document lists all of the quantities stored in the UCSB SUSY ROOT Tree created with configurableAnalysis.

Each quantity is listed in a table with related quantities for convenience. (This organization is not reflected in the ROOT tree itself.) The caption of each table gives the collection from which the each quantity in the table is obtained. The first column of the table gives the name used in the tree, while the second column specifies how that quantity was obtained from the physics object. For each quantity in the tree, it is therefore straightforward to determine how it was filled.

Many of the quantities in the tree are C++ vectors. For example, jets_et is a vector that stores the transverse energy of each jet in the event.

The table contains information in the following basic categories

- Overall event information
- MC generator information for the hard-scattering process
- MC generator information for muons with $p_T > 15$ GeV/c
- MC generator information for electrons with $p_T > 15$ GeV/c
- Jet information
- Cross-cleaned jets
- MET information
- Cross-cleaned MET information

- Hemisphere information
- Muon information
- Cross-cleaned muons
- Electron information
- Cross-cleaned electrons
- Tracks
- Photons (minimal information)
- HLT trigger results (all paths)
- L1 trigger results (all paths)

There is currently no information on b-tagging algorithms, τ jets, or particle flow. We expect to add such information in the future, as well as other quantities.

We believe that lepton parent information in the tree is not correct. This appears to be due to a problem in the input files, not the ntuple maker itself. Further study on this is needed.

The validation of the tree has been based on emulating a SUSY analysis performed by the Aachen group. This validation is not comprehensive.

In the future, this document will contain additional information on how the production ntuples are made.

Table 1: Event info variables in the tree.

name in tree	
run event csaweight procIDsplit	

Table 2: MC generator variables in the tree and how they are obtained. The collection used is genParticles and status = 3 (meaning the particle is from the hard scatter.

name in tree	**function to obtain quantity (C++ class)**
mc_doc_id	pdgId() (reco::GenParticle)
mc_doc_pt	pt() (reco::GenParticle)
mc_doc_px	px() (reco::GenParticle)
mc_doc_py	py() (reco::GenParticle)
mc_doc_pz	pz() (reco::GenParticle)
mc_doc_status	status() (reco::GenParticle)
mc_doc_mother_id	mother().pdgId() (reco::GenParticle)
mc_doc_vertex_x	vertex.x() (reco:GenParticle)
mc_doc_vertex_y	vertex.y() (reco:GenParticle)
mc_doc_vertex_z	vertex.z() (reco:GenParticle)
mc_doc_mass	mass() (reco:GenParticle)
mc_doc_numOfDaughters	NumberOfDaughters() (reco:GenParticle)

Table 3: MC generator muon variables in the tree and how they are obtained. The collection used is genParticles and status != 3 (meaning the particle is not from the hard scatter) and pt greater than 15 GeV.

name in tree	**function to obtain quantity (C++ class)**
mc_mus_id	pdgId() (reco::GenParticle)
mc_mus_pt	pt() (reco::GenParticle)
mc_mus_px	px() (reco::GenParticle)
mc_mus_py	py() (reco::GenParticle)
mc_mus_pz	pz() (reco::GenParticle)
mc_mus_status	status() (reco::GenParticle)
mc_mus_mother_id	mother().pdgId() (reco::GenParticle)
mc_mus_vertex_x	vertex.x() (reco:GenParticle)
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name in tree	function to obtain quantity (C++ class)
mc_mus_vertex_y	vertex.y() (reco:GenParticle)
mc_mus_vertex_z	vertex.z() (reco:GenParticle)
mc_mus_mass	mass() (reco:GenParticle)
mc_mus_numOfDaughters	NumberOfDaughters() (reco:GenParticle)

Table 4: MC generator electron variables in the tree and how they are obtained. The collection used is genParticles and status != 3 (meaning the particle is not from the hard scatter) and pt greater than 15 GeV.

name in tree	function to obtain quantity (C++ class)
mc_electrons_id	pdgId() (reco::GenParticle)
mc_electrons_pt	pt() (reco::GenParticle)
mc_electrons_px	px() (reco::GenParticle)
mc_electrons_py	py() (reco::GenParticle)
mc_electrons_pz	pz() (reco::GenParticle)
mc_electrons_status	status() (reco::GenParticle)
mc_electrons_mother_id	mother().pdgId() (reco::GenParticle)
mc_electrons_vertex_x	vertex.x() (reco:GenParticle)
mc_electrons_vertex_y	vertex.y() (reco:GenParticle)
mc_electrons_vertex_z	vertex.z() (reco:GenParticle)
mc_electrons_mass	mass() (reco:GenParticle)
mc_electrons_numOfDaughters	NumberOfDaughters() (reco:GenParticle)

Table 5: Jet variables in the tree and how they are obtained. The collection used is selectedLayer1Jets.

name in tree	**function to obtain quantity (C++ class)**
jets_et	et() (pat::Jet)
jets_pt	pt() (pat::Jet)
jets_px	px() (pat::Jet)
jets_py	py() (pat::Jet)
jets_pz	pz() (pat::Jet)
jets_eta	eta() (pat::Jet)
jets_phi	phi() (pat::Jet)
jets_theta	theta() (pat::Jet)
jets_status	status() (pat::Jet)
jets_Energy	energy() (pat::Jet)
jets_mass	mass() (pat::Jet)
jets_parton_Id	genParton().pdgId() (pat:Jet)
jets_parton_pt	genParton().pt() (pat:Jet)
jets_parton_phi	genParton().phi() (pat:Jet)
jets_parton_eta	genParton().eta() (pat:Jet)
jets_parton_energy	genParton().energy() (pat:Jet)
jets_parton_mass	genParton().mass() (pat:Jet)
jets_gen_et	genJet().et() (pat::Jet)
jets_gen_pt	genJet().pt() (pat::Jet)
jets_gen_eta	genJet().eta() (pat::Jet)
jets_gen_phi	genJet().phi() (pat::Jet)
jets_gen_energy	genJet().energy() (pat::Jet)
jets_gen_motherID	genJet().mother().pdgId() (pat::Jet)
jets_chgEmE	chargedEmEnergy() (pat::Jet)
jets_chgHadE	chargedHadronEnergy() (pat::Jet)
jets_chgMuE	chargedMuEnergy() (pat::Jet)
jets_chg_Mult	chargedMultiplicity() (pat::Jet)
jets_mu_Mult	muonMultiplicity() (pat::Jet)
jets_neutralEmE	neutralEmEnergy() (pat::Jet)
jets_neutralHadE	neutralHadronEnergy() (pat::Jet)
jets_neutral_Mult	neutralMultiplicity() (pat::Jet)
jets_mu_Mult	muonMultiplicity() (pat::Jet)

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Table 5 – continued from previous page

name in tree	function to obtain quantity (C++ class)
jets_corr_fctr_def	correctionFactor(1) (pat::Jet)
jets_corr_fctr_b	correctionFactor(4) (pat::Jet)
jets_emf	emEnergyFraction() (pat::Jet)
jets_ehf	energyFractionHadronic() (pat::Jet)
jets_n60	n60() (pat::Jet)
jets_n90	n90() (pat::Jet)
jets_area	towersArea() (pat::Jet)
jets_max_em	maxEInEmTowers() (pat::Jet)
jets_max_had	maxEInHadTowers() (pat::Jet)

Table 6: Cross Cleaned Jet variables in the tree and how they are obtained. The collection used is patcrosscleaner:ccJets.

name in tree	function to obtain quantity (C++ class)
ccjets_et	et() (pat::Jet)
ccjets_pt	pt() (pat::Jet)
ccjets_px	px() (pat::Jet)
ccjets_py	py() (pat::Jet)
ccjets_pz	pz() (pat::Jet)
ccjets_eta	eta() (pat::Jet)
ccjets_phi	phi() (pat::Jet)
ccjets_theta	theta() (pat::Jet)
ccjets_status	status() (pat::Jet)
ccjets_energy	energy() (pat::Jet)
ccjets_mass	mass() (pat::Jet)

Table 7: MET variables in the tree and how they are obtained. The collection used is selectedLayer1METs.

name in tree	**function to obtain quantity (C++ class)**
mets_et	et() (pat::MET)
mets_phi	phi() (pat::MET)
mets_ex	px() (pat::MET)
mets_ey	py() (pat::MET)
mets_gen_et	genMET().et() (pat::MET)
mets_gen_phi	genMET().phi() (pat::MET)
mets_sumEt	sumEt() (pat::MET)
mets_unCPhi	uncorrectedPhi() (pat::MET)
mets_unCPt	uncorrectedPt() (pat::MET)

Table 8: Cross Cleaned MET variables in the tree and how they are obtained. The collection used is patcross-cleaner:ccMETs.

name in tree	**function to obtain quantity (C++ class)**
ccmets_et	et() (pat::MET)
ccmets_pt	pt() (pat::MET)
ccmets_px	px() (pat::MET)
ccmets_py	py() (pat::MET)
ccmets_phi	phi() (pat::MET)
ccmets_status	status() (pat::MET)

Table 9: Hemisphere variables in the tree and how they are obtained. The collection used is selectedLayer1Hemispheres.

name in tree	**function to obtain quantity (C++ class)**
hemis_et	et() (pat::Hemisphere)
hemis_pt	pt() (pat::Hemisphere)
hemis_px	px() (pat::Hemisphere)
hemis_py	py() (pat::Hemisphere)
hemis_pz	pz() (pat::Hemisphere)
hemis_eta	eta() (pat::Hemisphere)
hemis_phi	phi() (pat::Hemisphere)
hemis_theta	theta() (pat::Hemisphere)
hemis_status	status() (pat::Hemisphere)

Table 10: Muon variables in the tree and how they are obtained. The collection used is selectedLayer1Muons

name in tree	**function to obtain quantity (C++ class)**
mus_tkHits	track().hitPattern().numberOfValidHits() (pat::Muon)
mus_cIso	caloIso() (pat::Muon)
mus_tIso	trackIso() (pat::Muon)
mus_id	leptonID() (pat::Muon)
mus_charge	charge() (pat::Muon)
mus_num_matches	numberOfMatches() (pat::Muon)
mus_et	et() (pat::Muon)
mus_pt	pt() (pat::Muon)
mus_px	px() (pat::Muon)
mus_py	py() (pat::Muon)
mus_pz	pz() (pat::Muon)
mus_eta	eta() (pat::Muon)
mus_phi	phi() (pat::Muon)
mus_theta	theta() (pat::Muon)
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name in tree	function to obtain quantity (C++ class)
mus_status	status() (pat::Muon)
mus_cm_chi2	combinedMuon().chi2() (pat::Muon)
mus_cm_ndof	combinedMuon().ndof() (pat::Muon)
mus_cm_chg	combinedMuon().charge() (pat::Muon)
mus_cm_pt	combinedMuon().pt() (pat::Muon)
mus_cm_px	combinedMuon().px() (pat::Muon)
mus_cm_py	combinedMuon().py() (pat::Muon)
mus_cm_pz	combinedMuon().pz() (pat::Muon)
mus_cm_eta	combinedMuon().eta() (pat::Muon)
mus_cm_phi	combinedMuon().phi() (pat::Muon)
mus_cm_theta	combinedMuon().theta() (pat::Muon)
mus_cm_d0	combinedMuon().d0() (pat::Muon)
mus_cm_dz	combinedMuon().dz() (pat::Muon)
mus_cm_vx	combinedMuon().vx() (pat::Muon)
mus_cm_vy	combinedMuon().vy() (pat::Muon)
mus_cm_vz	combinedMuon().vz() (pat::Muon)
mus_cm_numvalhits	combinedMuon().numberOfValidHits() (pat::Muon)
mus_cm_numlosthits	combinedMuon().numberOfLostHits() (pat::Muon)
mus_cm_d0Err	combinedMuon().d0Error() (pat::Muon)
mus_cm_dzErr	combinedMuon().dzError() (pat::Muon)
mus_cm_ptErr	combinedMuon().ptError() (pat::Muon)
mus_cm_etaErr	combinedMuon().etaError() (pat::Muon)
mus_cm_phiErr	combinedMuon().phiError() (pat::Muon)
mus_tk_chi2	track().chi2() (pat::Muon)
mus_tk_ndof	track().ndof() (pat::Muon)
mus_tk_chg	track().charge() (pat::Muon)
mus_tk_pt	track().pt() (pat::Muon)
mus_tk_px	track().px() (pat::Muon)
mus_tk_py	track().py() (pat::Muon)
mus_tk_pz	track().pz() (pat::Muon)
mus_tk_eta	track().eta() (pat::Muon)
mus_tk_phi	track().phi() (pat::Muon)
mus_tk_theta	track().theta() (pat::Muon)
mus_tk_d0	track().d0() (pat::Muon)
mus_tk_dz	track().dz() (pat::Muon)

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name in tree	function to obtain quantity (C++ class)
mus_tk_vx	track().vx() (pat::Muon)
mus_tk_vy	track().vy() (pat::Muon)
mus_tk_vz	track().vz() (pat::Muon)
mus_tk_numvalhits	track().numberOfValidHits() (pat::Muon)
mus_tk_numlosthits	track().numberOfLostHits() (pat::Muon)
mus_tk_d0Err	track().d0Error() (pat::Muon)
mus_tk_dzErr	track().dzError() (pat::Muon)
mus_tk_ptErr	track().ptError() (pat::Muon)
mus_tk_etaErr	track().etaError() (pat::Muon)
mus_tk_phiErr	track().phiError() (pat::Muon)
mus_stamu_chi2	standAloneMuon().chi2() (pat::Muon)
mus_stamu_ndof	standAloneMuon().ndof() (pat::Muon)
mus_stamu_chg	standAloneMuon().charge() (pat::Muon)
mus_stamu_pt	standAloneMuon().pt() (pat::Muon)
mus_stamu_px	standAloneMuon().px() (pat::Muon)
mus_stamu_py	standAloneMuon().py() (pat::Muon)
mus_stamu_pz	standAloneMuon().pz() (pat::Muon)
mus_stamu_eta	standAloneMuon().eta() (pat::Muon)
mus_stamu_phi	standAloneMuon().phi() (pat::Muon)
mus_stamu_theta	standAloneMuon().theta() (pat::Muon)
mus_stamu_d0	standAloneMuon().d0() (pat::Muon)
mus_stamu_dz	standAloneMuon().dz() (pat::Muon)
mus_stamu_vx	standAloneMuon().vx() (pat::Muon)
mus_stamu_vy	standAloneMuon().vy() (pat::Muon)
mus_stamu_vz	standAloneMuon().vz() (pat::Muon)
mus_stamu_numvalhits	standAloneMuon().numberOfValidHits() (pat::Muon)
mus_stamu_numlosthits	standAloneMuon().numberOfLostHits() (pat::Muon)
mus_stamu_d0Err	standAloneMuon().d0Error() (pat::Muon)
mus_stamu_dzErr	standAloneMuon().dzError() (pat::Muon)
mus_stamu_ptErr	standAloneMuon().ptError() (pat::Muon)
mus_stamu_etaErr	standAloneMuon().etaError() (pat::Muon)
mus_stamu_phiErr	standAloneMuon().phiError() (pat::Muon)

Table 11: Cross Cleaned Muon variables in the tree and how they are obtained. The collection used is patcross-cleaner:ccMuons.

name in tree	**function to obtain quantity (C++ class)**
ccmuons_et	et() (pat::Muon)
ccmuons_pt	pt() (pat::Muon)
ccmuons_px	px() (pat::Muon)
ccmuons_py	py() (pat::Muon)
ccmuons_pz	pz() (pat::Muon)
ccmuons_eta	eta() (pat::Muon)
ccmuons_phi	phi() (pat::Muon)
ccmuons_theta	theta() (pat::Muon)
ccmuons_status	status() (pat::Muon)

Table 12: Electron variables in the tree and how they are obtained. The collection used is selectedLayer1Electrons.

name in tree	**function to obtain quantity (C++ class)**
els_id	leptonID() (pat::Electron)
els_Ciso	caloIso() (pat::Electron)
els_tIso	trackIso() (pat::Electron)
els_chi2	gsfTrack().chi2() (pat::Electron)
els_class	classification() (pat::Electron)
els_charge	charge() (pat::Electron)
els_e	caloEnergy() (pat::Electron)
els_hadOverEm	hadronicOverEm() (pat::Electron)
els_eOverPIn	eSuperClusterOverP() (pat::Electron)
els_eSeedOverPOut	eSeedClusterOverPout() (pat::Electron)
els_eSCraw	superCluster().rawEnergy() (pat::Electron)
els_eSeed	superCluster().seed().energy() (pat::Electron)
els_dEtaIn	deltaEtaSuperClusterTrackAtVtx() (pat::Electron)
els_dPhiIn	deltaPhiSuperClusterTrackAtVtx() (pat::Electron)
els_dEtaOut	deltaEtaSeedClusterTrackAtCalo() (pat::Electron)
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name in tree	function to obtain quantity (C++ class)
els_dPhiOut	deltaPhiSeedClusterTrackAtCalo() (pat::Electron)
els_numvalhits	gsfTrack().numberOfValidHits() (pat::Electron)
els_numlosthits	gsfTrack().numberOfLostHits() (pat::Electron)
els_numCluster	numberOfClusters (pat::Electron)
els_tk_pt	gsfTrack.pt() (pat::Electron)
els_tk_phi	gsfTrack.phi() (pat::Electron)
els_tk_eta	gsfTrack.eta() (pat::Electron)
els_d0	gsfTrack().d0() (pat::Electron)
els_dz	gsfTrack().dz() (pat::Electron)
els_vx	gsfTrack().vx() (pat::Electron)
els_vy	gsfTrack().vy() (pat::Electron)
els_vz	gsfTrack().vz() (pat::Electron)
els_ndof	gsfTrack().ndof() (pat::Electron)
els_ptError	gsfTrack().ptError() (pat::Electron)
els_d0Error	gsfTrack().d0Error() (pat::Electron)
els_dzError	gsfTrack().dzError() (pat::Electron)
els_etaError	gsfTrack().etaError() (pat::Electron)
els_phiError	gsfTrack().phiError() (pat::Electron)
els_cpx	trackMomentumAtCalo().x() (pat::Electron)
els_cpy	trackMomentumAtCalo().y() (pat::Electron)
els_cpz	trackMomentumAtCalo().z() (pat::Electron)
els_vpx	trackMomentumAtVtx().x() (pat::Electron)
els_vpy	trackMomentumAtVtx().y() (pat::Electron)
els_vpz	trackMomentumAtVtx().z() (pat::Electron)
els_cx	TrackPositionAtCalo().x() (pat::Electron)
els_cy	TrackPositionAtCalo().y() (pat::Electron)
els_cz	TrackPositionAtCalo().z() (pat::Electron)
els_et	et() (pat::Electron)
els_pt	pt() (pat::Electron)
els_px	px() (pat::Electron)
els_py	py() (pat::Electron)
els_pz	pz() (pat::Electron)
els_eta	eta() (pat::Electron)
els_phi	phi() (pat::Electron)
els_theta	theta() (pat::Electron)

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name in tree	function to obtain quantity (C++ class)
els_status	status() (pat::Electron)
els_IDRobust	electronIDRobust()

Table 13: Cross Cleaned Electron variables in the tree and how they are obtained. The collection used is patcrosscleaner:ccElectrons.

name in tree	function to obtain quantity (C++ class)
ccelectrons_et	et() (pat::Electron)
ccelectrons_pt	pt() (pat::Electron)
ccelectrons_px	px() (pat::Electron)
ccelectrons_py	py() (pat::Electron)
ccelectrons_pz	pz() (pat::Electron)
ccelectrons_eta	eta() (pat::Electron)
ccelectrons_phi	phi() (pat::Electron)
ccelectrons_theta	theta() (pat::Electron)
ccelectrons_status	status() (pat::Electron)

Table 14: Track variables in the tree and how they are obtained. The collection used is ctfWithMaterialTracks.

name in tree	function to obtain quantity (C++ class)
tracks_chi2	combinedMuon().chi2() (reco::Track)
tracks_ndof	combinedMuon().ndof() (reco::Track)
tracks_chg	charge() (reco::Track)
tracks_pt	pt() (reco::Track)
tracks_px	px() (reco::Track)
tracks_py	py() (reco::Track)

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name in tree	function to obtain quantity (C++ class)
tracks_pz	pz() (reco::Track)
tracks_eta	eta() (reco::Track)
tracks_phi	phi() (reco::Track)
tracks_theta	theta() (reco::Track)
tracks_d0	d0() (reco::Track)
tracks_dz	dz() (reco::Track)
tracks_vx	vx() (reco::Track)
tracks_vy	vy() (reco::Track)
tracks_vz	vz() (reco::Track)
tracks_numvalhits	numberOfValidHits() (reco::Track)
tracks_numlosthits	numberOfLostHits() (reco::Track)
tracks_d0Err	d0Error() (reco::Track)
tracks_dzErr	dzError() (reco::Track)
tracks_ptErr	ptError() (reco::Track)
tracks_etaErr	etaError() (reco::Track)
tracks_phiErr	phiError() (reco::Track)
tracks_Nrechits	recHitsSize() (reco::Track)
tracks_innerHitX	innerPosition.x() (reco::Track)
tracks_innerHitY	innerPosition.y() (reco::Track)
tracks_innerHitZ	innerPosition.z() (reco::Track)
tracks_outerHitX	outerPosition.x() (reco::Track)
tracks_outerHitY	outerPosition.y() (reco::Track)
tracks_outerHitZ	outerPosition.z() (reco::Track)

Table 15: Photon variables in the tree and how they are obtained. The collection used is selectedLayer1Photons.

name in tree	function to obtain quantity (C++ class)
photons_et	et() (pat::Photon)
photons_pt	pt() (pat::Photon)
photons_px	px() (pat::Photon)
photons_py	py() (pat::Photon)

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name in tree	function to obtain quantity (C++ class)
photons_pz	pz() (pat::Photon)
photons_eta	eta() (pat::Photon)
photons_phi	phi() (pat::Photon)
photons_theta	theta() (pat::Photon)
photons_status	status() (pat::Photon)

Table 16: Trigger Path Results found in the Tree.

Trigger Path in Tree	source used to obtain Trigger Result
HLT1jet	TriggerResults::HLT
HLT2jet	TriggerResults::HLT
HLT3jet	TriggerResults::HLT
HLT4jet	TriggerResults::HLT
HLT1MET	TriggerResults::HLT
HLT2jetAco	TriggerResults::HLT
HLT1jet1METAco	TriggerResults::HLT
HLT1jet1MET	TriggerResults::HLT
HLT2jet1MET	TriggerResults::HLT
HLT3jet1MET	TriggerResults::HLT
HLT4jet1MET	TriggerResults::HLT
HLT1MET1HT	TriggerResults::HLT
CandHLT1SumET	TriggerResults::HLT
HLT1jetPE1	TriggerResults::HLT
HLT1jetPE3	TriggerResults::HLT
HLT1jetPE5	TriggerResults::HLT
CandHLT1jetPE7	TriggerResults::HLT
CandHLT1METPre1	TriggerResults::HLT
CandHLT1METPre2	TriggerResults::HLT
CandHLT1METPre3	TriggerResults::HLT
CandHLT2jetAve30	TriggerResults::HLT
CandHLT2jetAve60	TriggerResult::HLT
CandHLT2jetAve110	TriggerResult::HLT

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Trigger Path in Tree	source used to obtain Trigger Result
CandHLT2jetAve150	TriggerResult::HLT
CandHLT2jetAve200	TriggerResult::HLT
HLT2jetvbfMET	TriggerResult::HLT
HLTS2jet1METNV	TriggerResult::HLT
HLTS2jet1METAco	TriggerResult::HLT
CandHLTSjet1MET1Aco	TriggerResult::HLT
CandHLTSjet2MET1Aco	TriggerResult::HLT
CandHLTS2jetAco	TriggerResult::HLT
CandHLTJetMETRapidityGap	TriggerResult::HLT
HLT1Electron	TriggerResult::HLT
HLT1ElectronRelaxed	TriggerResult::HLT
HLT2Electron	TriggerResult::HLT
HLT2ElectronRelaxed	TriggerResult::HLT
HLT1Photon	TriggerResult::HLT
HLT1PhotonRelaxed	TriggerResult::HLT
HLT2Photon	TriggerResult::HLT
HLT2PhotonRelaxed	TriggerResult::HLT
HLT1EMHighEt	TriggerResult::HLT
HLT1EMVeryHighEt	TriggerResult::HLT
CandHLT2ElectronZCounter	TriggerResult::HLT
CandHLT2ElectronExclusive	TriggerResult::HLT
CandHLT2PhotonExclusive	TriggerResult::HLT
CandHLT1PhotonL1Isolated	TriggerResult::HLT
HLT1MuonIso	TriggerResult::HLT
HLT1MuonNonIso	TriggerResult::HLT
CandHLT2MuonIso	TriggerResult::HLT
HLT2MuonNonIso	TriggerResult::HLT
HLT2MuonJPsi	TriggerResult::HLT
HLT2MuonUpsilon	TriggerResult::HLT
HLT2MuonZ	TriggerResult::HLT
HLTNMuonNonIso	TriggerResult::HLT
HLT2MuonSameSign	TriggerResult::HLT
CandHLT1MuonPrescalePt3	TriggerResult::HLT
CandHLT1MuonPrescalePt5	TriggerResult::HLT
CandHLT1MuonPrescalePt7x7	TriggerResult::HLT

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Trigger Path in Tree	source used to obtain Trigger Result
CandHLT1MuonPrescalePt7x10	TriggerResult::HLT
CandHLT1MuonLevel1	TriggerResult::HLT
HLTB1Jet	TriggerResult::HLT
HLTB2Jet	TriggerResult::HLT
HLTB3Jet	TriggerResult::HLT
HLTB4Jet	TriggerResult::HLT
HLTBHT	TriggerResult::HLT
HLTB1JetMu	TriggerResult::HLT
HLTB2JetMu	TriggerResult::HLT
HLTB3JetMu	TriggerResult::HLT
HLTB4JetMu	TriggerResult::HLT
HLTBHTMu	TriggerResult::HLT
HLTBJPsiMuMu	TriggerResult::HLT
HLT1Tau	TriggerResult::HLT
HLT1Tau1MET	TriggerResult::HLT
HLT2TauPixel	TriggerResult::HLT
HLTXElectronBJet	TriggerResult::HLT
HLTXMuonBJet	TriggerResult::HLT
HLTXMuonBJetSoftMuon	TriggerResult::HLT
HLTXElectron1Jet	TriggerResult::HLT
HLTXElectron2Jet	TriggerResult::HLT
HLTXElectron3Jet	TriggerResult::HLT
HLTXElectron4Jet	TriggerResult::HLT
HLTXMuonJets	TriggerResult::HLT
HLTXElectronMuon	TriggerResult::HLT
HLTXElectronMuonRelaxed	TriggerResult::HLT
HLTXElectronTau	TriggerResult::HLT
HLTXMuonTau	TriggerResult::HLT
CandHLTHcalIsolatedTrack	TriggerResult::HLT
HLTMinBiasPixel	TriggerResult::HLT
HLTMinBias	TriggerResult::HLT
HLTZeroBias	TriggerResult::HLT

Table 17: L1 trigger path results. The collection is l1extraParticleMap and the C++ class is l1extra::L1ParticleMap. The trigger decisions are stored in eventB under the vector L1Triggerbits_pass, which has 120 entries for each L1 Trigger Decision. Each value of the vector has a 1 or 0 depending on whether the event triggered that L1 trigger. This table list the location of each trigger path in the vector L1Triggerbits_pass.

name in tree	**Index in L1Triggerbits_pass vector**
SingleMu3	0
SingleMu5	1
SingleMu7	2
SingleMu10	3
SingleMu14	4
SingleMu20	5
SingleMu25	6
SingleIsoEG5	7
SingleIsoEG8	8
SingleIsoEG10	9
SingleIsoEG12	10
SingleIsoEG15	11
SingleIsoEG20	12
SingleIsoEG25	13
SingleEG5	14
SingleEG8	15
SingleEG10	16
SingleEG12	17
SingleEG15	18
SingleEG20	19
SingleEG25	20
SingleJet15	21
SingleJet20	22
SingleJet30	23
SingleJet50	24
SingleJet70	25

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name in tree	Index in L1Triggerbits_pass vector
SingleJet00	26
SingleJet50	27
SingleJet200	28
SingleTauJet10	29
SingleTauJet20	30
SingleTauJet30	31
SingleTauJet35	32
SingleTauJet40	33
SingleTauJet60	34
SingleTauJet80	35
SingleTauJet100	36
HTT100	37
HTT200	38
HTT250	39
HTT300	40
HTT400	41
HTT500	42
ETM20	43
ETM30	44
ETM40	45
ETM50	46
ETM60	47
DoubleMu3	48
DoubleIsoEG8	49
DoubleIsoEG10	50
DoubleEG5	51
DoubleEG10	52
DoubleEG15	53
DoubleJet70	54
DoubleJet100	55
DoubleTauJet20	56
DoubleTauJet30	57
DoubleTauJet35	58
DoubleTauJet40	59
Mu3_IsoEG5	60

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name in tree	Index in L1Triggerbits_pass vector
Mu5_IsoEG10	61
Mu3_EG12	62
Mu3_Jet15	63
Mu5_Jet15	64
Mu3_Jet70	65
Mu5_Jet20	66
Mu5_TauJet20	67
Mu5_TauJet30	68
IsoEG10_EG10	69
IsoEG10_Jet15	70
IsoEG10_Jet20	71
IsoEG10_Jet30	72
IsoEG10_Jet70	73
IsoEG10_TauJet20	74
IsoEG10_TauJet30	75
EG10_Jet15	76
EG12_Jet20	77
EG12_Jet70	78
EG12_TauJet40	79
Jet70_TauJet40	80
Mu3_HTT200	81
IsoEG10_HTT200	82
EG12_HTT200	83
Jet70_HTT200	84
TauJet40_HTT200	85
Mu3_ETM30	86
IsoEG10_ETM30	87
EG12_ETM30	88
Jet70_ETM40	89
TauJet20_ETM20	90
TauJet30_ETM30	91
TauJet30_ETM40	92
HTT100_ETM30	93
TripleMu3	94
TripleIsoEG5	95

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Table 17 – continued from previous page

name in tree	Index in L1Triggerbits_pass vector
TripleEG10	96
TripleJet50	97
TripleTauJet40	98
DoubleMu3_IsoEG5	99
DoubleMu3_EG10	100
DoubleIsoEG5_Mu3	101
DoubleEG10_Mu3	102
DoubleMu3_HTT200	103
DoubleIsoEG5_HTT200	104
DoubleEG10_HTT200	105
DoubleJet50_HTT200	106
DoubleTauJet40_HTT200	107
DoubleMu3_ETM20	108
DoubleIsoEG5_ETM20	109
DoubleEG10_ETM20	110
DoubleJet50_ETM20	111
DoubleTauJet40_ETM20	112
QuadJet30	113
ExclusiveDoubleIsoEG6	114
ExclusiveDoubleJet60	115
ExclusiveJet25_Gap_Jet25	116
IsoEG10_Jet20_ForJet10	117
MinBias_HTT10	118
ZeroBias	119