Root Tree Description

Description of all classes used to store output data.

Parameter	Definition	How it was calculated
class Event		
Number	event number	
ReadTime	read time	
ProcTime	processing time	
class LHCOEvent		
Event	LHCOEvent inherits all Event parameters	
Trigger	trigger word	
class LHEFEvent		
Event	LHEFEvent inherits all Event parameters	
ProcessID	subprocess code for the event	hepup.IDPRUP
Weight	weight for the event	hepup.XWGTUP
ScalePDF	scale in GeV used in the calculation of the PDFs in the event	hepup.SCALUP
AlphaQED	value of the QED coupling used in the event	hepup.AQEDUP
AlphaQCD	value of the QCD coupling used in the event	hepup.AQCDUP
class LHEFWeight		
ID	weight ID	
Weight	weight value	
class HepMCEvent		
Event	HepMCEvent inherits all Event parameters	
ProcessID	unique signal process id	signal_process_id()
MPI	number of multi parton interactions	mpi ()
Weight	weight for the event	
Scale	energy scale, see hep-ph/0109068	event_scale()
AlphaQED	QED coupling, see hep-ph/0109068	alphaQED()
AlphaQCD	QCD coupling, see hep-ph/0109068	alphaQCD()
ID1	flavour code of first parton	pdf_info()->id1()
ID2	flavour code of second parton	pdf_info()->id2()
X1	fraction of beam momentum carried by first parton ("beam side")	pdf_info()->x1()
X2	fraction of beam momentum carried by second parton ("target side")	pdf_info()->x2()
ScalePDF	Q-scale used in evaluation of PDF's (in GeV)	pdf_info()->scalePDF()
PDF1	PDF (id1, x1, Q)	pdf_info()->pdf1()
PDF2	PDF (id2, x2, Q)	pdf_info()->pdf2()
class GenParticle		
PID	particle HEP ID number	hepevt.idhep[number]
Status	particle status	hepevt.isthep[number]
IsPU	0 or 1 for particles from pile-up interactions	
M1	particle 1st mother	hepevt.jmohep[number][0] - 1

M2	particle 2nd mother	hepevt.jmohep[number][1] - 1
D1	particle 1st daughter	hepevt.jdahep[number][0] - 1
D2	particle last daughter	hepevt.jdahep[number][1] - 1
Charge	particle charge	
Mass	particle mass	
E	particle energy	hepevt.phep[number][3]
Px	particle momentum vector (x component)	hepevt.phep[number][0]
Py	particle momentum vector (y component)	hepevt.phep[number][1]
Pz	particle momentum vector (z component)	hepevt.phep[number][2]
P	particle momentum	
PT	particle transverse momentum	
Eta	particle pseudorapidity	
Phi	particle azimuthal angle	
Rapidity	particle rapidity	
CtgTheta	particle cotangent of theta	
D0	particle transverse impact parameter	
DZ	particle longitudinal impact parameter	
T	particle vertex position (t component)	hepevt.vhep[number][3]
X	particle vertex position (x component)	hepevt.vhep[number][0]
Y	particle vertex position (y component)	hepevt.vhep[number][1]
Z	particle vertex position (z component)	hepevt.vhep[number][2]
class Vertex		
T	vertex position (t component)	
X	vertex position (x component)	
Y	vertex position (y component)	
Z	vertex position (z component)	
ErrorT	vertex position error (t component)	
ErrorX	vertex position error (x component)	
ErrorY	vertex position error (y component)	
ErrorZ	vertex position error (z component)	
Index	vertex index	
NDF	number of degrees of freedom	
Sigma	vertex position (z component) error	
SumPT2	sum pt^2 of tracks attached to the vertex	
GenSumPT2	sum pt^2 of gen tracks attached to the vertex	
GenDeltaZ	distance in z to closest generated vertex	
BTVSumPT2	sum pt^2 of tracks attached to the secondary vertex	
Constituents	references to constituents	
class MissingET		

MET	mising transverse energy	
Eta	mising energy pseudorapidity	
Phi	mising energy azimuthal angle	
class ScalarHT		
HT	scalar sum of transverse momenta	
class Rho		
Rho	rho energy density	
Edges[2]	pseudorapidity range edges	
class Weight		
Weight	weight for the event	
class Photon		
PT	photon transverse momentum	
Eta	photon pseudorapidity	
Phi	photon azimuthal angle	
E	photon energy	
T	particle arrival time of flight	
EhadOverEem	ratio of the hadronic versus electromagnetic energy deposited in the calorimeter	
Particles	references to generated particles	
IsolationVar	isolation variable	
IsolationVarRhoCorr	isolation variable	
SumPtCharged	isolation variable	
SumPtNeutral	isolation variable	
SumPtChargedPU	isolation variable	
SumPt	isolation variable	
class Electron		
PT	electron transverse momentum	
Eta	electron pseudorapidity	
Phi	electron azimuthal angle	
T	particle arrival time of flight	
Charge	electron charge	
EhadOverEem	ratio of the hadronic versus electromagnetic energy deposited in the calorimeter	
Particle	reference to generated particle	
IsolationVar	isolation variable	
IsolationVarRhoCorr	isolation variable	
SumPtCharged	isolation variable	
SumPtNeutral	isolation variable	
SumPtChargedPU	isolation variable	
SumPt	isolation variable	
class Muon		
PT	muon transverse momentum	
Eta	muon pseudorapidity	
Phi	muon azimuthal angle	
T	particle arrival time of flight	
Charge	muon charge	

Particle	reference to generated particle	
IsolationVar	isolation variable	
IsolationVarRhoCorr	isolation variable	
SumPtCharged	isolation variable	
SumPtNeutral	isolation variable	
SumPtChargedPU	isolation variable	
SumPt	isolation variable	
class Jet		
PT	jet transverse momentum	
Eta	jet pseudorapidity	
Phi	jet azimuthal angle	
Mass	jet invariant mass	
Flavor	jet flavor	
FlavorAlgo	jet flavor	
FlavorPhys	jet flavor	
BTag	0 or 1 for a jet that has been tagged as containing a heavy quark	
BTagAlgo	0 or 1 for a jet that has been tagged as containing a heavy quark	
BTagPhys	0 or 1 for a jet that has been tagged as containing a heavy quark	
TauTag	0 or 1 for a jet that has been tagged as a tau	
Charge	tau charge	
EhadOverEem	ratio of the hadronic versus electromagnetic energy deposited in the calorimeter	
NCharged	number of charged constituents	
NNeutrals	number of neutral constituents	
Beta	(sum pt of charged pile-up constituents)/(sum pt of charged constituents)	
BetaStar	(sum pt of charged constituents coming from hard interaction)/(sum pt of charged constituents)	
MeanSqDeltaR	average distance (squared) between constituent and jet weighted by pt (squared) of constituent	
PTD	average pt between constituent and jet weighted by pt of constituent	
FracPt[5]	(sum pt of constituents within a ring 0.1*i < DeltaR < 0.1*(i+1))/(sum pt of constituents)	
Tau[5]	N-subjettiness	
TrimmedP4[5]	first entry (i = 0) is the total Trimmed Jet 4-momenta and from i = 1 to 4 are the trimmed subjets 4-momenta	
PrunedP4[5]	first entry (i = 0) is the total Pruned Jet 4-momenta and from i = 1 to 4 are the pruned subjets 4-momenta	
SoftDroppedP4[5]	first entry (i = 0) is the total SoftDropped Jet 4-momenta and from i = 1 to 4 are the pruned subjets 4-momenta	
NSubJetsTrimmed	number of subjets trimmed	
NSubJetsPruned	number of subjets pruned	
NSubJetsSoftDropped	number of subjets soft-dropped	
Constituents	references to constituents	

Particles	references to generated particles	
class Track		
PID	HEP ID number	
Charge	track charge	
P	track momentum	
PT	track transverse momentum	
Eta	track pseudorapidity	
Phi	track azimuthal angle	
CtgTheta	track cotangent of theta	
EtaOuter	track pseudorapidity at the tracker edge	
PhiOuter	track azimuthal angle at the tracker edge	
T	track vertex position (t component)	
X	track vertex position (x component)	
Y	track vertex position (y component)	
Z	track vertex position (z component)	
TOuter	track position (t component) at the tracker edge	
XOuter	track position (x component) at the tracker edge	
YOuter	track position (y component) at the tracker edge	
ZOuter	track position (z component) at the tracker edge	
Xd	X coordinate of point of closest approach to vertex	
Yd	Y coordinate of point of closest approach to vertex	
Zd	Z coordinate of point of closest approach to vertex	
L	track path length	
D0	track transverse impact parameter	
DZ	track longitudinal impact parameter	
ErrorP	track momentum error	
ErrorPT	track transverse momentum error	
ErrorPhi	track azimuthal angle error	
ErrorCtgTheta	track cotangent of theta error	
ErrorT	time measurement error	
ErrorD0	track transverse impact parameter error	
ErrorDZ	track longitudinal impact parameter error	
Particle	reference to generated particle	
VertexIndex	reference to vertex	
class Tower		
ET	calorimeter tower transverse energy	
Eta	calorimeter tower pseudorapidity	
Phi	calorimeter tower azimuthal angle	
E	calorimeter tower energy	
T	ecal deposit time, averaged by sqrt(EM energy) over all particles, not smeared	
NTimeHits	number of hits contributing to time measurement	
Eem	calorimeter tower electromagnetic energy	

Ehad	calorimeter tower hadronic energy	
Edges[4]	calorimeter tower edges	
Particles	references to generated particles	
class HectorHit		
E	reconstructed energy [GeV]	
Tx	angle of the momentum in the horizontal (x,z) plane [urad]	
Ty	angle of the momentum in the verical (y,z) plane [urad]	
T	time of flight to the detector [s]	
X	horizontal distance to the beam [um]	
Y	vertical distance to the beam [um]	
S	distance to the interaction point [m]	
Particle	reference to generated particle	