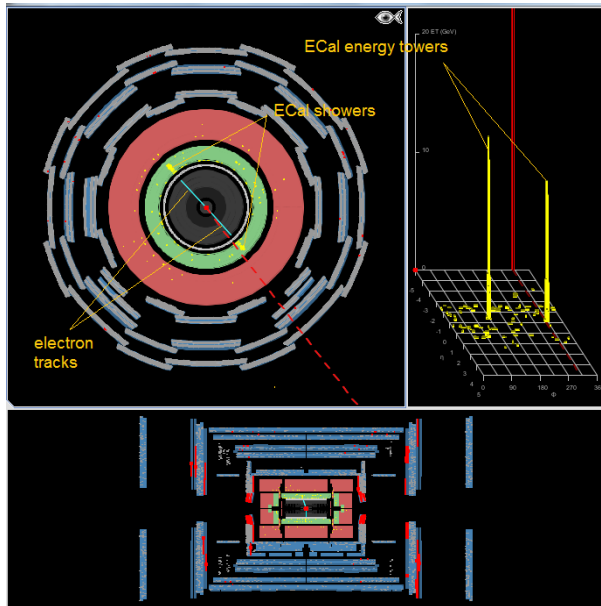




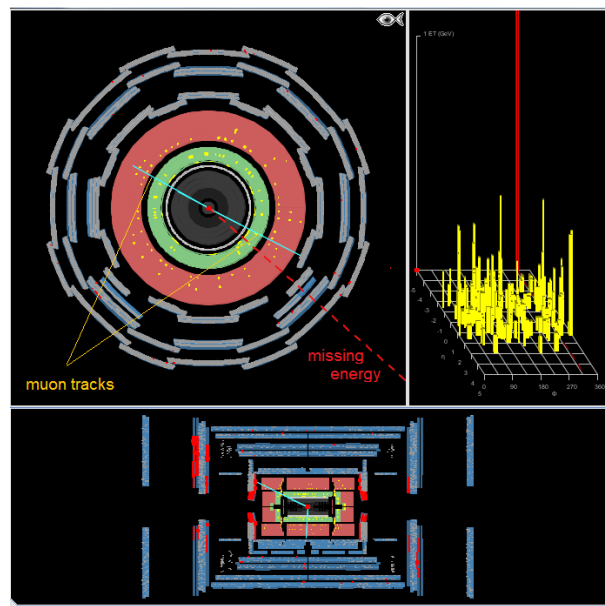
ATLAS Z-path Masterclass "Cheat Sheet"



2-lepton events



Dielectron or e^+e^- event.



Dimuon or $\mu^+\mu^-$ event.

4-lepton events

Canvas Window - File: event010.xml Run: 206497 Event: 4559547

HYPATIA - Track Momenta Window

File: Previous Event Next Event Electron Muon Photon Delete Track Reset Canvas

ETMis: 7.551 GeV ϕ : -3.042 rad Collection: MET_RefFinal

H:\QUARKNET\LHC2014\minerva\groupP.zip\event010.xml

Tracks	Physics Objects				
Track	+/-	P [GeV]	Pt [GeV]	ϕ	θ
Tracks 3	-	58.90	45.18	-0.168	0.874
Tracks 21	+	36.49	36.41	2.869	1.638
Tracks 407	+	85.50	43.24	-2.267	0.530
Tracks 413	-	20.12	15.77	0.141	2.241

note opposite charges

HYPATIA - Control Window

Parameter Control Interaction and Window Control Output Display

Projection Data Cuts InDet Calo MuonDet Objects Geometry

Data	Name	Value
<input checked="" type="checkbox"/>	Status	
<input checked="" type="checkbox"/>	InDet	
<input checked="" type="checkbox"/>	Calo	
<input checked="" type="checkbox"/>	MuonDet	
<input checked="" type="checkbox"/>	Objects	



ATLAS Z-path Masterclass "Cheat Sheet"



2-photon events

The screenshot displays the HYPATIA software interface for analyzing 2-photon events. It includes a detector geometry view, a 3D track visualization, and a table of physics objects.

Track	P [GeV]	PT [GeV]	ϕ	θ
Object 0	58.63	54.71	-1.921	1.939
Object 1	53.76	49.19	1.333	1.156

The Control Window shows the following parameters:

Category	Name	Value
InDet		
Calo	<input checked="" type="checkbox"/> Pt	> 15.0 GeV
MuonDet		
Objects	<input checked="" type="checkbox"/> d0	< 2.5 mm
ATLAS	<input checked="" type="checkbox"/> z0	< 20.0 cm
	<input type="checkbox"/> d0 Loose	< 2.0 cm
	<input type="checkbox"/> z0-zVtx	< 2.5 mm

Standard model chart

	mass →	charge →	spin →	Particle	mass	charge	spin	Particle	mass	charge	spin	Particle	mass	charge	spin	Particle						
QUARKS	≈2.3 MeV/c ²	2/3	1/2	u	≈1.275 GeV/c ²	2/3	1/2	c	≈173.07 GeV/c ²	2/3	1/2	t	0	0	1	g	≈126 GeV/c ²	0	0	0	H	
				up				charm				top				gluon					Higgs boson	
				d				s				b				γ					photon	
				down				strange				bottom				photon						
	LEPTONS	0.511 MeV/c ²	-1	1/2	e	105.7 MeV/c ²	-1	1/2	μ	1.777 GeV/c ²	-1	1/2	τ	91.2 GeV/c ²	0	1	Z					Z boson
					electron				muon				tau				Z boson					
				ν _e				ν _μ				ν _τ				W					W boson	
				electron neutrino				muon neutrino				tau neutrino				W boson						
				ν _e				ν _μ				ν _τ				W						
				electron neutrino				muon neutrino				tau neutrino				W boson						
			ν _e				ν _μ				ν _τ				W							
			electron neutrino				muon neutrino				tau neutrino				W boson							