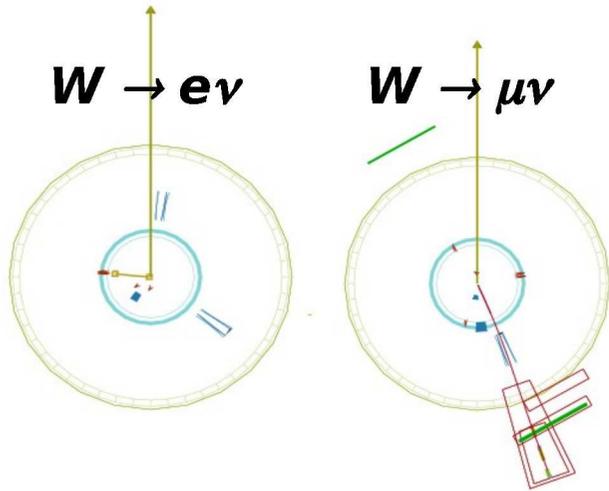
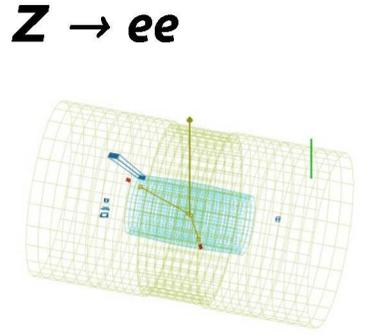
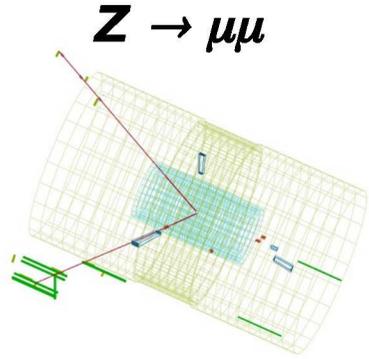
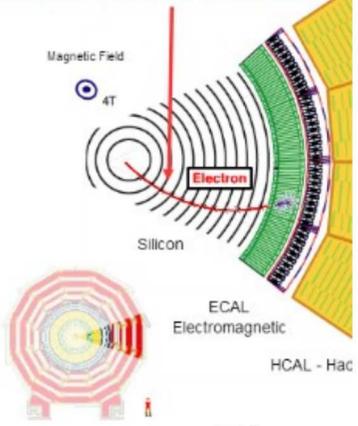


QuarkNet

# Cheat sheet

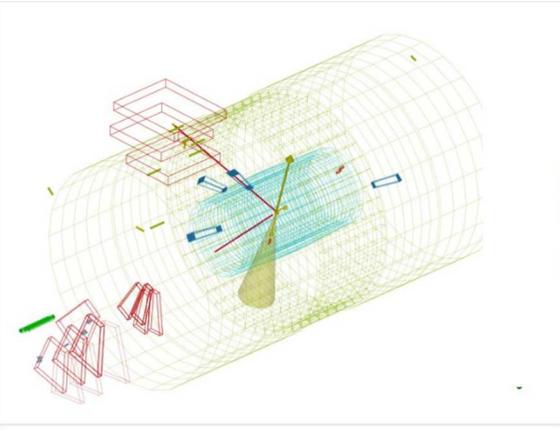


**Kaareutuminen!**

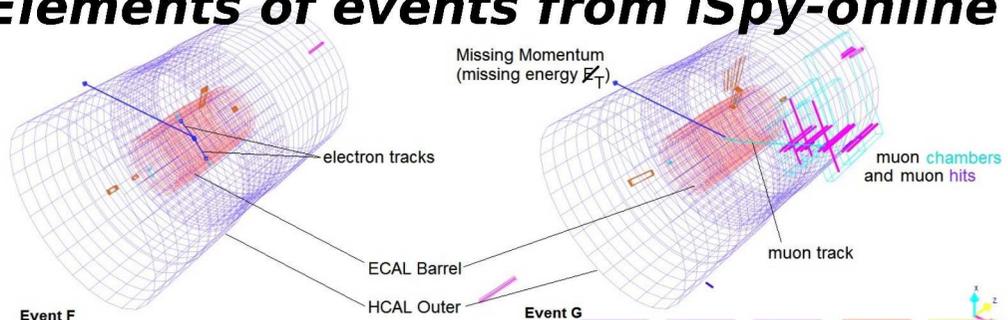
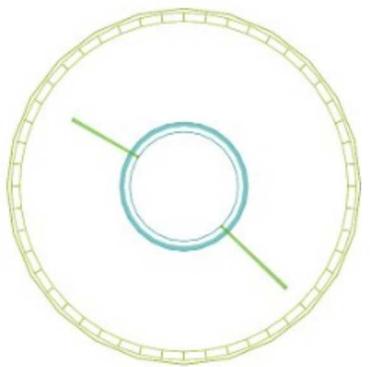


## Elements of events from iSpy-online

**H to ZZ**



**H to gamma gamma**



	mass → -2.3 MeV/c <sup>2</sup>	+1.275 GeV/c <sup>2</sup>	+175.07 GeV/c <sup>2</sup>	0	+126 GeV/c <sup>2</sup>
	charge → 2/3	2/3	2/3	0	0
	spin → 1/2	1/2	1/2	1	0
	<b>u</b>	<b>c</b>	<b>t</b>	<b>g</b>	<b>H</b>
	up	charm	top	gluon	Higgs boson
<b>QUARKS</b>	+4.6 MeV/c <sup>2</sup>	+95 MeV/c <sup>2</sup>	+4.18 GeV/c <sup>2</sup>	0	
	-1/3	-1/3	-1/3	0	
	1/2	1/2	1/2	1	
	<b>d</b>	<b>s</b>	<b>b</b>	<b>γ</b>	
	down	strange	bottom	photon	
	0.511 MeV/c <sup>2</sup>	105.7 MeV/c <sup>2</sup>	+1.777 GeV/c <sup>2</sup>	91.2 GeV/c <sup>2</sup>	
	-1	-1	-1	0	
	1/2	1/2	1/2	1	
	<b>e</b>	<b>μ</b>	<b>τ</b>	<b>Z</b>	
	electron	muon	tau	Z boson	
<b>LEPTONS</b>	<2.2 eV/c <sup>2</sup>	<0.17 MeV/c <sup>2</sup>	<15.5 MeV/c <sup>2</sup>	80.4 GeV/c <sup>2</sup>	
	0	1/2	0	±1	
	1/2	1/2	1/2	1	
	<b>ν<sub>e</sub></b>	<b>ν<sub>μ</sub></b>	<b>ν<sub>τ</sub></b>	<b>W</b>	
	electron neutrino	muon neutrino	tau neutrino	W boson	
					<b>GAUGE BOSONS</b>



# Cheat sheet

## Avaa CIMA

CIMA  
CMS Instrument for Masterclass Analysis

Choose your Masterclass: Helsinki-CERN-2023B  
 Choose your location: Helsinki-CERN-2023B  
 Choose your data file: Helsinki-CERN-2023B

Back Events Table (Group 100.11) Mass Histogram (Helsinki2023B) Results Helsinki2023B Event Display

Masterclass: CERN-09Mar2023  
Location: Helsinki2023B  
Group: 100.11

Select Event: Event index: 101, Event number: 100.11-101

Final State:  e $\nu$ ,  e $e$ ,  4e,  2e 2 $\mu$ ,   $\mu\nu$ ,   $\mu\mu$ ,  4 $\mu$

Primary State: Charged Particle:  W $^+$ ,  W $^-$ ,  Z,  Neutral Particle (Z, H),  Zoo

Enter Mass:  GeV/c $^2$  [Next]

Event index	Event number	Final state	Primary state	Mass
101100	100.11-100	ev	W-	
101099	100.11-99	$\mu\mu$	neutral	
101098	100.11-98	ev	W-	
101097	100.11-97	$\mu\mu$	neutral	
101096	100.11-96	$\mu\mu$	neutral	
101095	100.11-95	ev	zoo	
101094	100.11-94	uu	neutral	

Avaa Event Display

## Avaa kansio

Detector:

- Pixel Barrel
- Pixel Endcap (+)
- Pixel Endcap (-)
- Tracker Inner Barrel
- Tracker Outer Barrel
- Tracker Inner Detector (+)
- Tracker Inner Detector (-)
- Tracker Endcap (+)
- Tracker Endcap (-)
- ECAL Barrel
- ECAL Endcap (+)
- ECAL Endcap (-)

## Open file(s) from the Web

Open File

Open file(s) from the Web

Open local file(s): Browse... No files selected.

Close

Files	Events
./	Events/Run_1/Event_1
masterclass2019_1.ig	Events/Run_1/Event_2
masterclass2019_2.ig	Events/Run_1/Event_3
masterclass2019_3.ig	Events/Run_1/Event_4
masterclass2019_4.ig	Events/Run_1/Event_5
masterclass2019_5.ig	Events/Run_1/Event_6
masterclass2019_6.ig	Events/Run_1/Event_7

N100: Events/Run\_1/Event\_1

Close Load

Valitse file ja eventti 1

## Päätykuva varauksen määrittystä varten

Primary State:  Neutral Particle (Z, H)

Neutraalit hiukkaset: klikkaa jäljet harmaiksi ja paina m (niin kuin massa) ja kirjoita massa kohtaan "Enter mass"

Invariant mass

7.13 GeV

Close

Enter Mass

GeV/c $^2$

Next