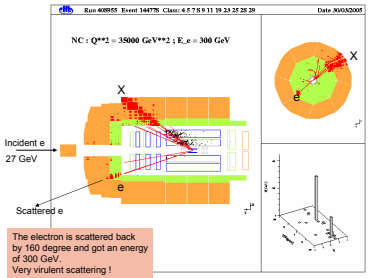
Events in the H1 Detector

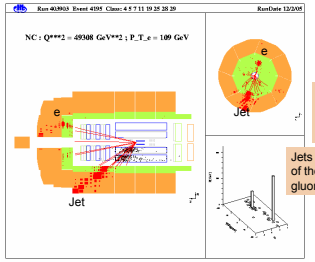
Back to the Deep-Inelastic-Electron-Proton-Scattering (DIS) $ep \to e'X$



The electron is scattered back by 160 degree and got an energy of 300 GeV.
Very virulent scattering !

.and here its even more virulent. $ep \to e'X$

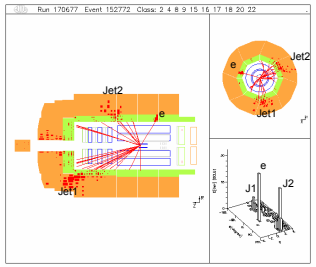
The squared momentum transfer is $Q^2 \approx 50000 GeV^2$, this corresponds to a space resolution of $\Delta x \approx 10^{-18} m$



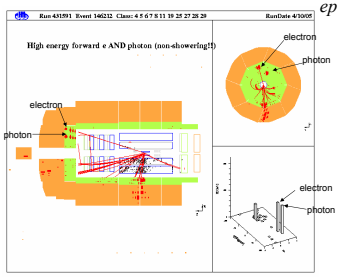
Notice :
The hadronic system X is a well collimated bundle of particles. This is called JET

Jets are the 'footprints' of the quarks and gluons

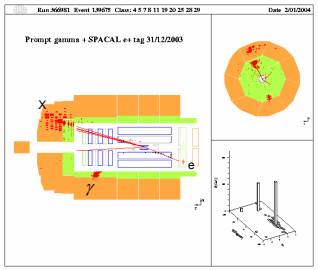
A NC-DIS event with two jets $ep \to e'Jet_1Jet_2$



Here the 'forward scattered' electron radiates a very energetic photon $ep \to e'X\gamma$



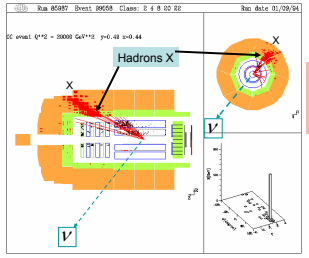
Another $ep \to e'X\gamma$ event, but here the scatted electron and photon are far apart



It is likely that here the photon is of hadronic origin (prompt photon)

A new event class : In this event the hadrons X are NOT balanced by an electron !

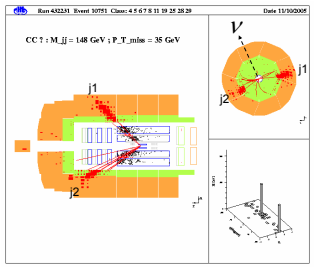
$ep \to \nu X$ The Neutrino does not leave a trace in the detector



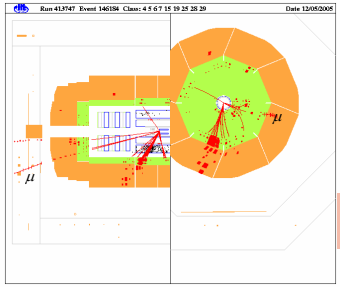
This is a different type of DIS event
It is pure weak interaction.

It is a Charged Current (CC) event

This is a CC event with a pronounced two-jet structure $ep \to \nu j_1 j_2$

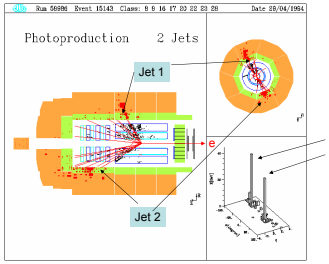


This CC event shows a muon separated from the jet



This could be a muon produced in the semileptonic decay of a charm quark

Another event class : 'Photoproduction'
Here two jets are visible, but the scattered electron is not recorded, it leaves the detector under very small scattering angle



Needles of energy