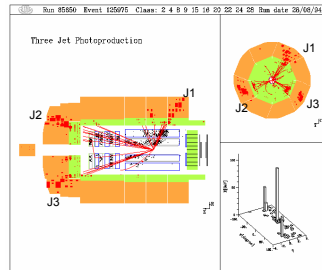


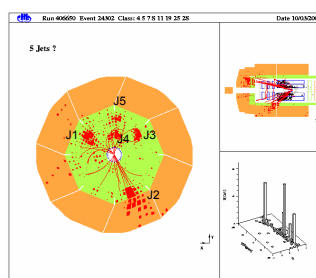
Events in the H1 Detector

Here a THREE-JET-EVENT



H1 Events Joachim Meyer DESY 2005

Here 5 jets are visible, there is no limit in the number.

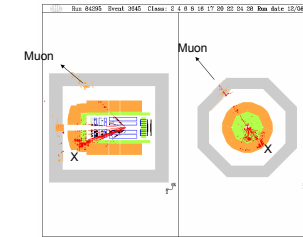


H1 Events Joachim Meyer DESY 2005

Quarks radiate gluons, which in turn may radiate gluons or produce quark-antiquark pairs. All turn (if energetic enough) to visible jet structures

The most exciting issue : Are there new phenomena, we don't expect ?

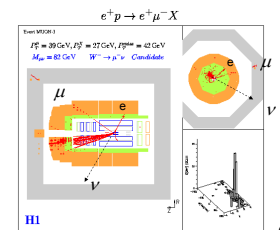
We have seen $ep \rightarrow e' X$ DIS - events
But this looks like $ep \rightarrow \mu X$ (As such forbidden in HEP Standard Model)



H1 Events Joachim Meyer DESY 2005

Fluctuating background or sign of new physics ?

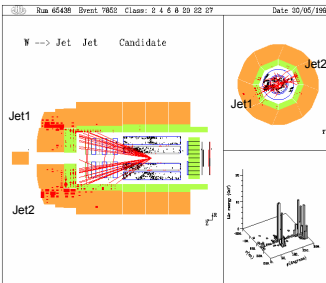
Similar event, but here also the scattered electron is visible. This allows to reconstruct the invariant mass of the muon-neutrino-system. It turns out to be 82 GeV. That's close to the W mass.



H1 Events Joachim Meyer DESY 2005

$ep \rightarrow eXW \dots W \rightarrow \mu\nu$

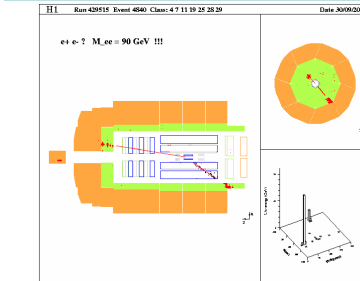
H1 sees more events than expected from this reaction. New physics ?



H1 Events Joachim Meyer DESY 2005

The W decays also into quark-antiquark producing two jets. The jet-jet-mass is 80 GeV, just the known W-mass.

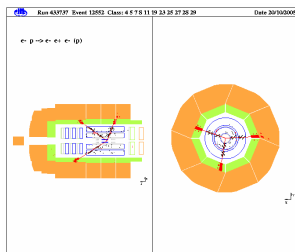
The W particle has a sister, the Z, of 90 GeV mass, decaying into lepton pairs



H1 Events Joachim Meyer DESY 2005

$Z_0 \rightarrow e^+e^-$

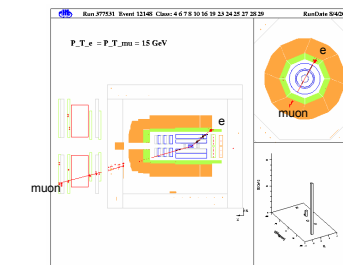
Here a positron and 2 electrons are recorded. Presumably the scattered electron and a pair created in the interaction



H1 Events Joachim Meyer DESY 2005

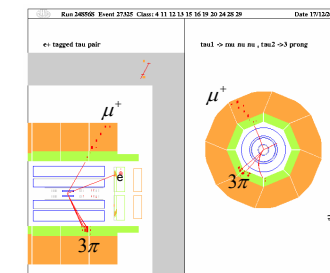
Note : All 'electrons' are well confined in the electromagnetic part (green) of the calorimeter

There are also dilepton events with different lepton types : Electron and muon



H1 Events Joachim Meyer DESY 2005

A pair of tau-mesons with the scattered electron



H1 Events Joachim Meyer DESY 2005

$ep \rightarrow e(p)\tau^+\tau^-$

$\tau^+ \rightarrow \mu^+\nu$

$\tau^- \rightarrow \pi^-\pi^+\pi^-\nu$