Figure 1: Top left: contour plots of fixed θ_e and E'_e in the x, Q^2 plane for $E_e = 30$ GeV and $E_p = 820$ GeV. The dashed lines bracketing the isoenergy lines at $E'_e = 30$ and $E'_e = 25$ GeV show the energy resolution of the backward electromagnetic calorimeter (BEMC, $151^\circ < \theta_e < 176^\circ$) at these energies, the dashed lines bracketing the isoenergy line at $E'_e = 40$ GeV the resolution of the liquid argon calorimeter (LAr, $4^\circ < \theta_e < 154^\circ$). Similarly the dashed isoangle lines indicate the angular resolution at $\theta_e = 165^\circ$ and $\theta_e = 90^\circ$, respectively. Bottom right: domains in the Q^2, x plane, where the systematic errors on $d^2\sigma/(dxdQ^2)$ are below 10%. The dotted lines correspond to constant y. The contours correspond to areas where different kinematic reconstruction methods have been used (from reference [106]). The area in the lower right corner corresponds to the range accessible to previous experiments.

Figure 2: Schematic layout of the H1 detector.

Figure 3: Longitudinal cut through the H1 detector along the beam line.

Figure 4: Front view of the H1 detector with the southern and the northern shells of the iron yoke opened.

Figure 5: Cross section of the beam pipe in the H1 detector. IP: interaction point, GP: getter pump, M: beam profile monitor, C6: synchrotron radiation mask (see also Figure 7). The lower part shows an enlarged view of the forward part with the flexible bellow connections and synchrotron radiation mask C4 (right).

Figure 6: Performance of the HERA storage ring in the first three years of operation. Left: beam currents (top) and luminosity (bottom) measured during a typical run. Right: integrated luminosity accumulated by H1 over the running periods 1992 - 1994.

Figure 7: Arrangement of synchrotron masks shielding the H1 detector from direct synchrotron radiation (from reference [107]).

Figure 8: Main coil field map over the tracking volume. Here z denotes the distance to median plane, see text.

Figure 9: The layout of the luminosity system.

Figure 10: $e - \gamma$ energy correlation for bremsstrahlung events detected by the luminosity calorimeters. In the upper right corner the total reconstructed energy is shown. These data are from the beginning of the 1994 HERA e^-p run at 27.5 GeV $\times$ 820 GeV collision energy.

Figure 11: Data provided by the luminosity system during the $e-p$ collisions at HERA. Statistical fluctuations correspond to one measurement every 10 s.

Figure 12: (a) $z-$vertex reconstruction by building a histogram, which displays a peak at the true vertex location. (b) Block diagram of the $z-$vertex trigger.

Figure 13: Block diagram of the drift chamber trigger.

Figure 14: Block diagram of the liquid argon calorimeter trigger.

Figure 15: Cross section through the θ plane of the liquid argon calorimeter showing the pointing geometry of the trigger big towers.

Figure 16: BEMC single electron trigger efficiency for thresholds CL1 and CL2.

Figure 17: Principle of track recognition in the forward muon trigger.

Figure 18: The frontend response time as a function of the instantaneous input frequency (=1/time between consecutive events). The increase at rates above 100 Hz is related to a buffering limitation in the drift chamber readout, which has subsequently been cured.

Figure 19: Flow of slow control data within H1. The data flow between the database server and slow control computers over TCP/IP has been omitted.

Figure 20: Overview of the H1 data acquisition system.

Figure 21: VMEtaxi fundamentals.

Figure 22: Physical layout of the key features of the H1 data acquisition system. See text for details.

Figure 23: Multi-event buffer units.

Figure 24: Full event buffer units.

Figure 25: Physical composition of the central part of the H1 data acquisition system as during the data taking periods of 1993 and 1994.

Figure 26: H1 off-line computing environment

Figure 27: Schematic view of the parametrized shower simulation in a coarse geometry.

Figure 28: Physics analysis with LOOK

Figure 29: Typical two jet event from $\gamma - g$ fusion tagged by an electron in the tagger.

Figure 30: Absolute trigger rates recorded in the backward electromagnetic calorimeter in function of cluster energy at different trigger and reconstruction levels.

Figure 31: Typical high Q^2 event with both the scattered electron and the hadronic recoil jet observed in the LAr calorimeter.

Figure 32: Invariant mass distribution of elastically (top) and inelastically (bottom) produced $\mu^+\mu^-$ pairs in J/Ψ photoproduction. The curve is a fit of a Gaussian plus a polynomial background to the J/Ψ mass region. The shaded histogram shows the contribution of QED lepton pairs (top figure) and the contribution of like sign muon pairs (bottom figure). The maximum of the fit is at 3.10$\pm$0.01 GeV with a width of 76 MeV, and at 3.10$\pm$0.01 GeV with a width of 65 MeV for the top and bottom distributions respectively, the detector simulation yielding in each case a width of respectively 65 MeV and 60 MeV.

Figure 33: K_s^0 (left) and $\Lambda(\bar{\Lambda})$ (right) signal observed in the central jet chamber.