May 25th 1996
Abstract pa02-062 submitted to the 28th International Conference on High Energy Physics ICHEP'96, Warsaw, Poland, July 1996

Measurements of Jet Production and Energy Flow in Diffractive *ep* Interactions at HERA

H1 Collaboration

Abstract

The properties of the hadronic final state X in diffractive ep interactions are presented using data collected by the H1 experiment at HERA. The data were taken during 1994 and correspond to $\sim 2\,\mathrm{pb}^{-1}$. Measurements of the energy flow $\frac{1}{N}\frac{\mathrm{d}E}{\mathrm{d}\eta^*}$ are made in the γ^*-pomeron ($I\!P$) centre–of–mass system for different regions of M_X, the mass of system X. For all values of M_X the data exhibit a significant excess of energy production in the central ($\eta^* \sim 0$) region over that expected for a quark dominated process. Cross sections for the diffractive production of di-jets are evaluated differentially as functions of P_T^2, η^* and $\xi = (\hat{s} + Q^2)/(M_X^2 + Q^2)$ in the laboratory frame for $Q^2 < 4\,\mathrm{GeV}^2$, and in the γ^*-p and γ^*-$I\!P$ centre–of–mass systems for $Q^2 > 4\,\mathrm{GeV}^2$. The distribution in ξ is demonstrated to be sensitive to the gluon distribution in the diffractive exchange. The data for both di-jet production and energy flow are well described by Monte Carlo predictions based on a partonic model of $eI\!P$ interactions in which the parton densities are derived from a QCD analysis of the diffractive structure function $F_2^{D(3)}$. In this model the gluons are concentrated near $x_{g/I\!P} = 1$ at $Q^2 \sim Q_0^2 = 2.5\,\mathrm{GeV}^2/\mathrm{c}^2$ and carry most of the momentum of the diffractive exchange. The properties of the remnant of the system M_X not contained in the di-jet system are presented.

Plenary Sessions:
2. Soft Interactions and diffraction Phenomena - S. Levonian
4. QCD and Low x Physics - H. Abramowicz, R. Brock

Parallel Session: I Strong Interaction Physics
2. Soft Interactions
3. Structure Functions and Low x Physics
4. Hard Processes and Perturbative QCD