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Measurement of Event Shape Variables in Deep Inelastic ep Scattering

H1 Collaboration

Deep inelastic ep scattering data, taken with the H1 detector at HERA, are used to study the event shape variables thrust, jet–broadening and jet mass in the current hemisphere of the Breit frame over a large range of momentum transfers Q between 7 GeV and 100 GeV. The data are compared with results from e^+e^- experiments. Using second order QCD calculations and an approach to relate hadronisation effects to power corrections, an analysis of the Q dependence of the means of the event shape parameters is presented, from which both the power corrections and the strong coupling constant are determined without the need for any assumption concerning hadronic fragmentation. The power corrections of all event shape variables investigated follow a $1/Q$ behaviour and can be described by a common parameter $\bar{\alpha}_0$.