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Study of Rapidity Gap Events in Hadronic Z Decays from e^+e^- Annihilation

L3 Collaboration

Abstract

Rapidity gaps have been studied in 3 jet events from hadronic Z decays to search for colour singlet exchange in e^+e^- annihilation. Particle flow and angular separation have been investigated in well separated completely symmetric 3 jet events from 77.6 pb^{-1} data collected by the L3 experiment. Asymmetries, defined with respect to the inter-jet regions, are found to be sensitive to the exchange of a colour singlet instead of a colour octet gluon. From a comparison of the distributions between data and Monte Carlo predictions for colour octet and colour singlet production, a limit is obtained on the fraction of of colour singlet exchange in the data. The analysis has been extended to study QCD models allowing modifications of colour topologies in 3 jet events.

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