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Contact Person: Juan Alcaraz
Institute: CERN
Email: Juan.Alcaraz@cern.ch

Study of hadronic event structure and α_S determination at $192 < \sqrt{s} < 208$ GeV

L3 Collaboration

Abstract

Results are presented from a study of the structure of high energy hadronic events recorded by the L3 detector at $\sqrt{s} \geq 192$ GeV. The distributions of several event shape variables are compared to resummed $\mathcal{O}(\alpha_s^2)$ QCD calculations. We determine the strong coupling constant at three average centre-of-mass energies: 194.4, 200.2 and 206.2 GeV. These measurements, combined with previous L3 measurements at lower energies, demonstrate the running of α_s as expected in QCD and yield $\alpha_s(m_Z) = 0.1227 \pm 0.0012 \pm 0.0058$, where the first uncertainty is experimental and the second is theoretical.

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