QCD studies with e^+e^- annihilation data at 172-189 GeV

The OPAL Collaboration

Abstract

We have studied hadronic events from e^+e^-annihilation data at centre-of-mass energies of $\sqrt{s}$ =172, 183 and 189 GeV. The total integrated luminosity of the three samples, measured with the OPAL detector, corresponds to 250 pb^{-1}. We present distributions of event shape variables, charged particle multiplicity and momentum, measured separately in the three data samples. From these we extract measurements of the strong coupling α_s, the mean charged particle multiplicity $\langle n_{\mathrm{ch}} \rangle$ and the peak position ξ_0 in the $\xi_p = \ln(1/x_p)$ distribution. In general the data are described well by analytic QCD calculations and Monte Carlo models. Our measured values of α_s, $\langle n_{\mathrm{ch}} \rangle$ and ξ_0 are consistent with previous determinations at $\sqrt{s}$=M_{Z^0}.

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