



UNIVERSITA' DEGLI STUDI DI PAVIA

DOTTORATO DI RICERCA IN FISICA

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Measurements of the Strong Coupling α_s

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Abstract: The coupling strength of the Strong Interaction, α_s , is the least precisely known of the fundamental coupling "constants" of nature. In contrast to its numerical value, which is not given by the underlying theory, Quantum Chromodynamics (QCD), its energy dependence is precisely predicted by theory and successfully verified by a multitude of measurements. This verification led to granting the 2004 Nobel Prize in Physics for the theoretical concept of Asymptotic Freedom of Quarks and Gluons, the constituents of all hadronic (nuclear) matter.

The status of measurements of α_s and the current world average value of $\alpha_s(M_Z)$, i.e. α_s at the energy scale of the mass of the Z_0 boson, are summarised, emphasizing the difficulties and uncertainties that limit such determinations.

