

High-precision α_s from W decays at FCC-ee

The hadronic branching ratio of the W boson BR_{had} , computed today at next-to-next-to-leading order (NNLO) accuracy, can be used to determine the QCD coupling α_s using the experimental data to be collected in $e^+e^- \rightarrow W^+W^-$ processes at the FCC-ee. By exploiting the huge data sample of 5×10^8 W bosons (a thousand times more than the 5×10^5 W's collected at LEP), the statistical uncertainty on BR_{had} can be reduced to around 0.005%. By combining the measurement of BR_{had} and $(1 - BR_{lep})$, α_s can be extracted with a state-of-the-art experimental uncertainty of order 0.2%. The associated parametric and theoretical uncertainties of such an α_s determination will be also discussed.

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