

# Abstract

In this work we perform a QCD analysis on hadronic  $\tau$  lepton decays. We make use of the ALEPH data to fit the strong coupling and higher order OPE contributions. Our approach is based on the QCDSR, especially the framework of FOPT, which we apply for the  $V + A$  channel of the inclusive Cabibbo-allowed hadronic  $\tau$  decay data. We perform this fits using a new set of analytic weight functions to shed light on the discussion of the importance of DV while determining the strong coupling  $\alpha_s$  at the  $m_\tau^2$  scale. We found a value of  $\alpha_s(m_\tau^2) = 0.3261(51)$  for the strong coupling. For the OPE dimension six and eight contributions we found  $C_6 = -0.68(20)$  and  $C_8 = -0.80(38)$ . While performing fits using differently pinched weights we showed that DV play only a minor role, even for single pinched weights, if the fits are performed in the  $V + A$  channel, using FOPT with an  $s_{\min} \gtrsim 2.1$  GeV. In comparing fits performed in the framework of the BS with fits performed in FOPT we found that these fits highly agree. In the discussion of FOPT vs CIPT we consequently favour FOPT and discourage the use of CIPT.