

PARTICLEFACE 2021: Unraveling New Physics Workshop & Management Committee Meeting



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On the difference between FOPT and CIPT for hadronic tau decays

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Hadronic tau decays are one of the important classic means to measure the value of the strong coupling. Since many years there is a discrepancy between two different ways to treat the QCD perturbation series, called FOPT and CIPT, which is larger than the scale uncertainties of both individual series, and which add an additional annoying uncertainty in the extracted strong coupling value. There was no conceptual insight into this discrepancy up to now. In this talk I present the results of a recent work where it was shown that the Borel representations of both expansions in general differ, which contrasts the previous understanding that the Borel representation is unique. The difference implies that the OPE for the FOPT and the CIPT series in general differ and that the CIPT OPE does not have the standard form assumed in previous phenomenological analyses. Depending on whether the QCD perturbation series is asymptotic or not, this may resolve the issue. Furthermore, phenomenological analyses based on CIPT have

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