Abstract Submitted
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New Results on the Hadronic Tau Decay Determination of α_s KIM MALTMAN, Math and Stats, York University — Finite energy sum rule (FESR) analyses of non-strange hadronic τ decay data provide one of the most precise determinations of the strong coupling constant, α_s. Over the last two years, analyses of the relevant current-current two-point functions based on the recently derived 5-loop result for the relevant $D = 0$ OPE contributions have reached a nominal precision of order 1%, and brought the resulting determination of $\alpha_s(M_Z^2)$ into excellent agreement with independent lattice results. An outstanding issue for the FESR analyses is the possibility of residual "duality violation", i.e. of contributions associated with the breakdown of the OPE in the vicinity of the timelike real invariant-squared-mass axis. In this talk I discuss recent work to investigate and quantify these effects and present results for the impact of such contributions on the determination of α_s, as well as on the determination of the $D = 6$ condensates appearing in the OPE representation of the non-strange vector minus axial vector correlator difference, which condensates are relevant to determining the chiral limit values of the $K \to \pi\pi$ matrix elements of the electroweak penguin operators in the Standard Model.The reported analysis also provides a new determination of the gluon condensate.

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