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Renormalon subtraction in hadronic tau decays

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The hadronic tau decay width is regarded as an important observable from which the strong coupling can be extracted precisely. However, the inconsistency in the calculations between two perturbative methods, known as FOPT and CIPT, had been a long standing problem until recently. We propose a new method to remove the renormalon divergence, which has turned out to cause the problem, by utilizing the gradient flow. Compared with the previously proposed method, our method can skip estimate of the renormalon normalization and can give the unambiguous gluon condensate by lattice simulations. In this talk, I will explain the idea and show that the FOPT and CIPT calculations exhibit mutually consistent results.

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