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## Takuya Agemura "On Λ\_QCD<sup>2</sup>/m renormalons of pole mass and interquark potential"

Wednesday, 8 November 2023 10:00 (25 minutes)

Discovery of the cancellation of  $O(\Lambda_QCD)$  renormalons in the QCD potential and quark pole masses improved dramatically our understanding of the quark masses, and furthermore, enabled precise determination of the fundamental physical constants, such as alpha\_s(Mz), m\_b, m\_c and Vcb. Here, we aim to extend our understanding to the cancellation of  $O(\Lambda_QCD^2)$  renormalons, whose nature has not been studied so far. This cancellation is expected to occur between the pole quark masses and non-abelian (NA) potential, -CA*CF*alpha\_s^2/mr^2. We perform 3 analyses: (i) We calculate the  $O(\Lambda_QCD^2)$  renormalons of the NA potential in the LL approximation; (ii) Beyond LL approx., we confirm the cancellation of the  $O(\Lambda_QCD^2)$  renormalons at the level of 84-98%; (iii) After the cancellation (beyond LL approx.), the convergence and stability of the perturbative prediction in fact improve. These results indicate that the NA potential and pole masses each carry  $O(\Lambda_QCD^2)$  renormalons and that they cancel out in the heavy quarkonium system.

Session Classification: Short talks