

Two-loop perturbative calculations toward a new approach to quark mass determination using the gradient flow

Wednesday 12 February 2025 11:00 (30 minutes)

We propose a new method for quark mass determination utilizing the gradient flow. The matching of a ratio of flowed bilinear operators between the perturbative and lattice results determines the $\overline{\text{MS}}$ mass, potentially contributing to a more precise determination. In this talk, we present perturbative results at two loops: semianalytic expressions in the small- and large- $m^2 t$ limits and numerical results over a wide range of $m^2 t$. We develop a new method to expand loop integrals in $m^2 t$ or $1/(m^2 t)$, based on the Laplace transform.

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