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The gradient flow at higher orders in perturbation theory

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We describe the systematic treatment of the gradient flow at higher orders in perturbation theory and its application within the small flow-time expansion. The results include the coefficients of the gradient-flow definition of the energy-momentum tensor, the quark and the gluon condensates, as well as the hadronic vacuum polarization at next-to-next-to-leading order in the strong coupling. Combined with suitable lattice calculations, these results allow for independent approaches to various phenomenological problems of low-energy QCD.

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