

The perturbative $SU(N)$ one-loop running coupling in the twisted gradient flow scheme

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We report on our computation of the perturbative running of the 't Hooft coupling in a pure gauge $SU(N)$ theory with twisted boundary conditions. The computation was performed using gradient flow methods in four dimensions, in the continuum, and using dimensional regularisation. The coupling is defined in terms of the energy density of the flow fields at a scale given by a particular combination of the linear size of the torus and the rank of the gauge group. We will present our strategy to regulate the divergences for a generic twist tensor, along with our results for the case of a two-dimensional non-trivial twist, analysing the dependence of the coupling with the finite size of the torus and the rank of the group, as well as the dependence on the magnetic flux induced by the twist.

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