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# Topological susceptibility and Gribov copies

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The topological susceptibility, $\chi^4$, plays an important role in explaining the $\eta'$ mass, the so-called $U(1)_A$ problem. For $\chi^4 \neq 0$, we must have the Veneziano ghost, an unphysical massless pole in the correlation function of the topological current $K_\mu$ correlator. There was a recent attempt in http://inspirehep.net/record/1340323?ln=en to connect the dynamics of the Veneziano ghost, and thus topological susceptibility, with Gribov copies. However, we will discuss that this proposal is incompatible with BRST symmetry, following http://inspirehep.net/record/1402613?ln=en. We will also analyze the topological susceptibility in $SU(2)$ and $SU(3)$ Euclidean Yang-Mills theory in a generic linear covariant gauge taking into account the Gribov ambiguity, while keeping the BRST symmetry. During this analysis, we make use of a Pad{\' e} approximation based on the K\"all\'en-Lehmann spectral integral representation of the topological current correlation function.

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