

# Background Effective Action with Nonlinear Massive Gauge Fixing

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Non-Abelian gauge theories constitute fundamental building blocks in the description of elementary particle interactions and exhibit by construction invariance under local gauge transformations.

Quantization entails a breaking of such symmetry, which is generally restored by imposing a constraint equation (e.g. Zinn-Justin equation), as well as a natural emergence of a global symmetry called BRST symmetry. In our study, we employ the background field method to construct an action which preserves both gauge and BRST invariance manifestly. The construction features BRST invariant mass parameters for the gluon and ghost fields.

In our formalism, we compute the running coupling and examine the implications of such a construction in the form and behavior of the one-loop effective action.

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