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Renormalization of $SU(2)$ Yang-Mills theory with flow equations. (English) Zbl 1442.81051
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Summary: We give a proof of perturbative renormalizability of $SU(2)$ Yang-Mills theory in four-dimensional Euclidean space which is based on the flow equations of the renormalization group. The main motivation is to present a proof which does not make appear mathematically undefined objects (as, for example, dimensionally regularized generating functionals), which permits to parametrize the theory in terms of *physical* renormalization conditions, and which allows to control the singularities of the correlation functions of the theory in the infrared domain. Thus a large part of the proof is dedicated to bounds on massless correlation functions.

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MSC:

- 81T13 Yang-Mills and other gauge theories in quantum field theory
- 81T08 Constructive quantum field theory
- 81T15 Perturbative methods of renormalization applied to problems in quantum field theory
- 81T17 Renormalization group methods applied to problems in quantum field theory

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