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Simplified functional flow equation

We propose to adapt the precise definition of the flowing effective action in order to obtain a functional flow equation with simple properties close to physical intuition. The simplified flow equa- tion is invariant under local gauge transformations and suitable for both euclidean and Minkowski signature and analytic continuation. The cutoff always removes fluctuations close to zeros of the inverse full propagator. A formulation of the simplified flow equation in terms of renormalized scale invariant fields permits direct access to scaling solutions and associated fixed points. Corrections to the simplified flow equation involve a field-dependent modification of the cutoff for which we discuss a systematic expansion. Truncated solutions for a scalar field theory We propose to adapt the precise definition of the flowing effective action in order to obtain a functional flow equation with simple properties close to physical intuition. The simplified flow equa- tion is invariant under local gauge transformations and suitable for both euclidean and Minkowski signature and analytic continuation. The cutoff always removes fluctuations close to zeros of the inverse full propagator. A formulation of the simplified flow equation in terms of renormalized scale invariant fields permits direct access to scaling solutions and associated fixed points. Corrections to the simplified flow equation involve a field-dependent modification of the cutoff for which we discuss a systematic expansion. Truncated solutions for a scalar field theory in four dimensions suggest a new fixed point with a field-dependent coefficient of the kinetic term.

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