

## Some Recent Results on Renormalization-Group Properties of Quantum Field Theories

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We discuss higher-loop calculations of renormalization-group (RG) flows of quantum field theories. We focus on properties at infrared fixed points of the RG in vectorial asymptotically free gauge theories with various gauge groups and fermion contents, including the anomalous dimensions of the fermion bilinear operator  $\bar{\psi}\psi$ . We have calculated these with inputs up to five-loop order in powers of the IR coupling  $\alpha_{IR}$ . It is also valuable to perform corresponding calculations with a method that is independent of the scheme used for regularization and renormalization, and we have done this, using a manifestly scheme-independent variable. Much of this work is in collaboration with T. Rytov. Comparisons are made with lattice measurements of these anomalous dimensions. We also mention the results of our investigations, using the six-loop beta function, to assess the possibility of an ultraviolet fixed point of the RG in a non-asymptotically free model, namely the  $O(N) \lambda|\vec{\phi}|^4$  theory.

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