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Fermionic functional renormalization group flows into phases with broken symmetry ROLAND GERSCH, Max-Planck-Institute for Solid State Research, Stuttgart, Germany, CARSTEN HONERKAMP, Wuerzburg University, Germany — We describe how functional renormalization group flows for interacting fermions can be continued into phases with broken symmetries. A symmetry-breaking term in the initial condition for the self-energy prevents a true divergence of the interactions at the critical scale. At the same scale, the anomalous self-energy grows rapidly such that the flow can be followed down to zero scale and all modes can be integrated out. Within simple mean-field models, we demonstrate two versions of this idea: one where the initial symmetry breaking is sent to zero, and another where it is compensated by a counter-term. The latter scheme is capable of detecting symmetry-broken phases separated from the symmetric state by an energy barrier. We discuss generalizations to more realistic models. Refs.: M. Salmhofer et al., Prog. Theor. Phys. 112, 943 (2004); R. Gersch et al., Euro. Phys. J. B 48: 349 (2005); R. Gersch et al., cond-mat/0609520.

Roland Gersch
Max-Planck-Institute for Solid State Research, Stuttgart, Germany

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