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The constraint potential for fermionic order parameters

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The quantum effective potential is an object, often central in the discussion of spontaneous symmetry breaking, however, it is not directly accessible in lattice simulations. Therefore here we concentrate on the closely related constraint potential. It is defined by a path integral, where all local fluctuations are taken into account but the volume averaged order parameter is fixed. This ensures that in the thermodynamic limit one recovers the effective potential. The Grassmanian nature of fermionic fields complicates the definition of such a construction, and so we discuss the arising problems and possible solutions. Most prominently we introduce an approximation scheme with numerical feasibility for Monte Carlo lattice QCD simulations in mind.

Primary author: MARKO, Gergely (Bielefeld University)

Co-authors: ENDRODI, Gergely (Bielefeld University); PANNULLO, Laurin (University of Bielefeld); KOVACS, Tamas G. (Department of Physics and Astronomy, Eotvos University, Budapest)

Presenter: MARKO, Gergely (Bielefeld University)

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