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Flattening of the quantum effective potential in fermionic theories

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We present mechanisms to constrain fermionic condensates on the level of the path integral, which grant access to the quantum effective potential in the infinite volume limit. In the case of a spontaneously broken symmetry this potential possesses a manifestly flat region, which is usually inaccessible to the standard approach of a double limit of volume and explicit symmetry breaking. By constraining the appropriate order parameters such as the chiral condensate, one is then able to probe the flat region. We demonstrate our method of constraining fermionic condensates in low-dimensional four-fermion models, which exhibit a spontaneously broken chiral symmetry. We show how the potential flattens in the infinite volume limit and that the flat region is dominated by inhomogeneous field configurations.

Topical area

Vacuum Structure and Confinement

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