

MP 3: Quantenfeldtheorie

Zeit: Dienstag 16:30–17:20

Raum: HS 8

MP 3.1 Di 16:30 HS 8

Gauge-fixing and the Gribov-Singer ambiguity — ●AXEL MAAS
— Institute for Theoretical Physics, University of Jena, Germany

Gauge-fixing is a useful tool in intermediate steps of calculations in quantum gauge field theories. However, in non-Abelian gauge theories it is complicated non-perturbatively by the Gribov-Singer ambiguity.

Several aspects of this ambiguity and proposals for its resolution in the class of Landau gauges will be presented, especially in view of the necessity to perform the same type of gauge-fixing both in the continuum and on the lattice. This has implications also for global residual gauge symmetries, like the BRST symmetry or the breaking of global symmetries by the Higgs mechanism.

MP 3.2 Di 16:55 HS 8

Supersymmetric $O(N)$ models in $d=3$ with functional renormalization group (FRG) methods — ●TOBIAS HELLWIG¹, MARIANNE HEILMANN¹, ANDREAS WIPF¹, and DANIEL F. LITHIM² —

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While a lot of results concerning scalar $O(N)$ models are known, much less is known for supersymmetric $O(N)$ models. The $1/N$ expansions were examined in some earlier works with the help of the Hartree-Fock approximation.

In this talk results for all N are presented. These results were obtained by using FRG methods and a manifest supersymmetric regulator.

For finite N fixed point solutions and critical exponents are obtained. We will comment on effects of different truncations in the effective average action. Starting point is the LPA approximation. In a second step a wave function renormalization is included and deviations from LPA solution are discussed. This will be done for a field dependent and field independent form of the wave function renormalization. This knowledge could also prove to be helpful for further FRG studies of supersymmetric theories.