



Contribution ID: 29

Type: not specified

Multiloop flow equations for single-boson exchange FRG

Tuesday, 26 July 2022 16:15 (20 minutes)

The recently introduced single-boson exchange (SBE) decomposition [2] of the four-point vertex of interacting fermionic many-body systems is a conceptually and computationally appealing parametrization of the vertex. It relies on the notion of reducibility of vertex diagrams with respect to the bare interaction U , instead of a classification based on two-particle reducibility within the widely-used parquet decomposition. We re-derived the SBE decomposition in a generalized framework (suitable for extensions to, e.g., inhomogeneous systems or real-frequency treatments) following from the parquet equations. We then derived multiloop functional renormalization group (mfRG) flow equations [3] for the ingredients of this SBE decomposition, both in the parquet approximation, where the fully two-particle irreducible vertex is treated as an input, and in the more restrictive SBE approximation, where this role is taken by the fully U -irreducible vertex. Moreover, we give mfRG flow equations for the popular parametrization of the vertex in terms of asymptotic classes [4] of the two-particle reducible vertices. Since the parquet and SBE decompositions are closely related, their mfRG flow equations are very similar in structure. [1] E. Walter, M. Gievers, A. Ge, J. von Delft, F. B. Kugler, *aXiv:2201.04878* (2022). [2] F. Krien, A. Valli, M. Capone, *PRB* 100, 155149 (2019). [3] F. B. Kugler, J. von Delft, *Phys. Rev. Lett.* 120, 057403 (2018). [4] N. Wentzell, G. Li, A. Tagliavini, C. Taranto, G. Rohringer, K. Held, A. Toschi, S. Andergassen *PRB* 102, 085106 (2020)

Presenter: GIEVERS, Marcel