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Many-body adiabatic dynamics via convergent expansions

jeudi 30 mai 2024 11:15 (55 minutes)

I will discuss how to represent the real-time dynamics of lattice fermionic systems exposed to slowly varying time-dependent perturbations in terms of Euclidean (i.e. imaginary time) correlation functions. The advantage is that, in many situations, time-ordered Euclidean correlation functions satisfy much better space-time decay estimates than their real-time counterparts. As an application, I will discuss how the cluster expansion for Euclidean correlations can be used to prove the convergence of the real-time Duhamel series for gapped, weakly interacting many-body fermionic systems, and the many-body adiabatic theorem at low temperature. In the last part of the talk, I will focus on gapless models, and I will show how the framework can be used to study the validity of linear response for non-interacting 1d systems and for edge currents. Based on a joint work with R. L. Greenblatt, M. Lange, G. Marcelli, and on ongoing work with H. P. Singh.

Orateur: PORTA, Marcello (SISSA, Trieste)