

Abstract

Plenary

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Linear response for gapped extended quantum systems

Joint with Giovanna Marcelli

I will first review the problem of justifying linear response theory for gapped extended quantum systems, where typical perturbations close the spectral gap and drive the initial ground state into an almost-stationary state that is no longer even close to an eigenstate of the perturbed Hamiltonian. Then I present a recent approach to the rigorous justification of linear (and higher order) response based on an explicit construction of such almost-stationary states and a generalisation of the adiabatic theorem of quantum mechanics. The latter shows that even though the spectral gap closes, the evolution still adiabatically follows these almost-stationary states on appropriate time-scales.

My talk is based on [[ArXiv:1708.03581](https://arxiv.org/abs/1708.03581), CMP Online First] and an ongoing joint project with Giovanna Marcelli.