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Title: Analyticity of the ground state in the pair interaction model

Abstract:

In this talk, we consider the analyticity of the pair interaction model. This is a quantum field models with second-order interactions, and historically considered as a model describing nucleon-meson interactions. We study this model in an abstract setting. Then the Pauli-Fierz model in the dipole approximation can be described in this framework. This model is one of the solvable models for quantum fields and is diagonalized by a Bogoliubov transformation. Here, solvable means that the Hamiltonian is unitarily equivalent to the second quatization of a one-particle Hamiltonian, but note that the spectrum is not trivial. We will discuss the analyticity for the ground state and ground state energies in the coupling constant. They generally have a finite radius of convergence, and their radii of convergence are estimated in detail.