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Title: Existence of ground states of translation-invariant Pauli-Fierz models

Abstract: We consider translation-invariant Pauli-Fierz models describing an electron interacting with a quantized electromagnetic field. One can decompose the Hamiltonian with respect to the total momentum in a direct integral. For zero total momentum we show the existence of a ground state for all values of the coupling constant. In the case of non-zero momentum one has to pass to a coherent state representation inequivalent to the Fock representation in order that a ground state exists. Then we can prove the same result for almost all total momenta being small enough.