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*Existence of ground states of translation-invariant Pauli-Fierz models*

We consider a translation-invariant non-relativistic QED model describing an electron interacting with a quantized electromagnetic field. Due to the translation-invariance one can decompose the Hamiltonian into a direct integral such that one obtains an operator for each fixed total momentum. For zero total momentum we show the existence of a ground state for all values of the coupling constant by using a compactness argument. 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.