Boson Fields with the :Φ^4: Interaction in Three Dimensions[*]

JAMES GLIMM

Massachusetts Institute of Technology
Cambridge, Mass.

Abstract. The :Φ^4: interaction for boson fields is considered in three dimensional space time. A space cutoff is included in the interaction term. The main result is that the renormalized Hamiltonian H_{ren} is a densely defined symmetric operator. In addition to the infinite vacuum energy and infinite mass renormalizations, this theory has an infinite wave function renormalization. Consequently the Hilbert space (of physical particles) in which H_{ren} acts is disjoint from the bare particle Fock Hilbert space in which the unrenormalized Hamiltonian is defined.

Contents