



Oscillator Representation in Quantum Physics

By M. Dineykh

Springer-Verlag GmbH Apr 2014, 2014. Taschenbuch. Condition: Neu. Neuware - The investigation of most problems of quantum physics leads to the solution of the Schrodinger equation with an appropriate interaction Hamiltonian or potential. However, the exact solutions are known for rather a restricted set of potentials, so that the standard eternal problem that faces us is to find the best effective approximation to the exact solution of the Schrodinger equation under consideration. In the most general form, this problem can be formulated as follows. Let a total Hamiltonian H describing a relativistic (quantum field theory) or a nonrelativistic (quantum mechanics) system be given. Our problem is to solve the Schrodinger equation $H\psi = E\psi$, i. e., to find the energy spectrum and the proper wave functions ψ including the ground state or vacuum ($\psi = \psi_0$). The main idea of any approximation technique is to find a decomposition in such a way that H_0 describes our physical system in the 'closest to H ' manner, and the Schrodinger equation $H_0\psi_0 = E_0\psi_0$ can be solved exactly. The interaction Hamiltonian H_1 is supposed to give small corrections to the zero approximation which can be calculated...

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