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Nota di contenuto

Front matter -- Preface -- Acknowledgements -- Contents -- 1. Introduction -- 2. Relativistic equations of motion -- 3. Basic exact solutions -- 4. Particles in fields of special structure -- 5. Dirac-Pauli equation and its solutions -- 6. Propagators of relativistic particles -- 7. Electron interacting with a quantized electromagnetic plane wave -- 8. Spin equation and its solutions -- 9. One-dimensional Schrödinger equation and its solutions -- 10. Coherent states -- A. Appendix 1 -- B. Appendix 2 -- Bibliography -- Index -- Backmatter

Sommario/riassunto

The Dirac equation is of fundamental importance for relativistic quantum mechanics and quantum electrodynamics. In relativistic quantum mechanics, the Dirac equation is referred to as one-particle wave equation of motion for electron in an external electromagnetic field. In quantum electrodynamics, exact solutions of this equation are needed to treat the interaction between the electron and the external field exactly. In this monograph, all propagators of a particle, i.e., the various Green's functions, are constructed in a certain way by using exact solutions of the Dirac equation.