Relativistic Wave Mechanics

By Ernesto Corinaldesi

Dover Publications Inc., United States, 2015. Paperback. Book Condition: New. 228 x 150 mm. Language: English . Brand New Book. Geared toward advanced undergraduate and graduate students of physics, this text provides readers with a background in relativistic wave mechanics and prepares them for the study of field theory. The treatment originated as a series of lectures from a course on advanced quantum mechanics that has been further amplified by student contributions. An introductory section related to particles and wave functions precedes the three-part treatment. An examination of particles of spin zero follows, addressing wave equation, Lagrangian formalism, physical quantities as mean values, translation and rotation operators, spin zero particles in electromagnetic field, pi-mesic atoms, and discontinuous transformations. The second section explores particles of spin one-half in terms of spin operators, the Weyl and Dirac equations, constants of motion, plane wave solutions and invariance properties of the Dirac equation, the Dirac equation for a charged particle in an electromagnetic field, non-relativistic limit of the Dirac equation, and Dirac particle in a central electrostatic field. The final section, on collision and radiation processes, covers time-independent scattering of a spinless particle, non-relativistic steady-state scattering of a particle of spin one-half, time-independent scattering...

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