



Quantum Physics

A derivation of the Breit equation from Barut's covariant formulation of electrodynamics in terms of direct interactions

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We study Barut's covariant equations describing the electromagnetic interactions between N spin-1/2 particles. In the covariant formulation each particle is described by a Dirac spinor. It is assumed that the interactions between the particles are not mediated by a bosonic field (direct interactions). Within this formulation, using the Lagrangian formalism, we derive the approximate (semirelativistic) Breit equation for two interacting spin-1/2 particles.

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