



High Energy Physics - Theory

Spinning-particle model for the Dirac equation and the relativistic Zitterbewegung

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We construct the relativistic particle model without Grassmann variables which meets the following requirements. A) Canonical quantization of the model implies the Dirac equation. B) The variable which experiences $\{it$ Zitterbewegung $\}$, represents a gauge non-invariant variable in our model. Hence our particle does not experiences the undesirable $\{it$ Zitterbewegung $\}$. C) In the nonrelativistic limit spin is described by three-vector, as it could be expected.

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