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**One-particle reducible contribution to the one-loop spinor propagator in a constant field.**

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Summary: Extending work by Gies and Karbstein on the Euler-Heisenberg Lagrangian, it has recently been shown that the one-loop propagator of a charged scalar particle in a constant electromagnetic field has a one-particle reducible contribution in addition to the well-studied irreducible one. Here we further generalize this result to the spinor case, and find the same relation between the reducible term, the tree-level propagator and the one-loop Euler-Heisenberg Lagrangian as in the scalar case. Our demonstration uses a novel worldline path integral representation of the photon-dressed spinor propagator in a constant electromagnetic field background.

#### MSC:

[81V10](#) Electromagnetic interaction; quantum electrodynamics

[70S05](#) Lagrangian formalism and Hamiltonian formalism in mechanics of particles and systems

[78A35](#) Motion of charged particles

[81S40](#) Path integrals in quantum mechanics

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