

Fermion source corrections to the Euler-Heisenberg effective action

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Content

A fermion determinant in the presence of a background electromagnetic field is worked out in the limit of large fermion mass. An extended Euler-Heisenberg effective action is obtained up to terms of dimension M8, with additional corresponding photon couplings to the fermion current. Different types of couplings emerge being, some of them, imaginary. In particular, an electromagnetic wave emission or absorption Lagrangian term is clearly identified. This EFT lead to quantum corrections to the Maxwell equations.

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