# The NRQED Lagrangian at order $1/M^4$

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The parity and time-reversal invariant effective Lagrangian
for a heavy fermion interacting with an Abelian gauge field, i.e.,
NRQED, is constructed through order $1/M^4$. The implementation of
Lorentz invariance in the effective theory becomes nontrivial at this order,
and a complete solution for Wilson coefficient constraints is obtained. Matching
conditions in the one-fermion sector are presented in terms of form
factors and two-photon matrix elements of the nucleon.
The extension of NRQED to describe interactions of the heavy fermion with a
light fermion is introduced.
Sample applications are discussed; these include
the computation of nuclear structure effects in atomic bound
states, the model-independent analysis of radiative corrections to
low-energy lepton-nucleon scattering, and the study of static
electromagnetic properties of nucleons.

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