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Elastic neutrino-electron scattering within the effective field theory approach

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Summary

Elastic neutrino-electron scattering provides an important tool for normalizing neutrino flux in modern experiments. This process is subject to large radiative corrections. We determine the Fermi effective theory performing the one-loop matching to the Standard model at the electroweak scale with subsequent running down to low energies. Based on this theory, we analytically evaluate virtual corrections and distributions with one radiated photon beyond the electron energy spectrum and provide the resulting scattering cross sections quantifying errors for the first time. We discuss the relevance of radiative corrections depending on conditions of modern accelerator-based neutrino experiments.

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