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Elastic neutrino-electron scattering. Theory for experiment

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 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 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.

Mini-abstract

Neutrino-electron scattering cross sections are precisely evaluated for neutrino flux normalization.

Experiment/Collaboration

Theory

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