Low energy analysis of nu N -> nu N gamma in the Standard Model

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The production of single photons in low energy (~1 GeV) neutrino scattering off nucleons is analyzed in the Standard Model. At very low energies, $E(nu) \ll 1$ GeV, a simple description of the chiral lagrangian involving baryons and arbitrary SU(2)_L x U(1)_Y gauge fields is developed. Extrapolation of the process into the ~1-2 GeV region is treated in a simple phenomenological model. Coherent enhancements in compound nuclei are studied. The relevance of single photon events as a background to experimental searches for nu(mu) -> nu(e) is discussed. In particular, single photons are a plausible explanation for excess events observed by the MiniBooNE experiment.

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