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Coherent elastic scattering between neutrinos and nuclei

In the limit of low momentum transfer for neutrino nuclei elastic scattering is expected to observe a coherent superposition in the cross section for the nucleons that compose the nucleus, increasing the interaction cross section. This effect was already observed for scattering for electrons, but due to experimental difficulties it have never been verified in neutrino scattering. Some groups dedicated to its verification were created. Beside it, the next generations of dark matter detectors probably will be sensitive to this interactions.
A study of the expected signal produced by coherent elastic scattering for neutrinos from different sources (solar, atmosphere, diffuse flux from supernovae, reactors and accelerators) was made. Considering a conservative threshold o 1 keV, as a detectable nuclear recoil, the most promising source to be observed is the 8B neutrinos produced in the Sun, with an expected rate of ~100 events/(ton*year). Another promising source is the reactor, but the use of this source is quite dependent of the possible distance between reactor and detector. For a detector far 1 km from the reactor it is expected ~10 events/(ton*year), but if be possible decrease this distance for 100 m the rate would be increased to 1000 events/(ton*year).

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