

Limiting the effective magnetic moment of Solar neutrinos with the Borexino detector

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A minimal extension of the electroweak standard model with a massive neutrino allows a non zero magnetic moment, with the neutrino magnetic moment proportional to the neutrino mass. The experimental evidence from solar, reactor, atmospheric and accelerator neutrinos has demonstrated that neutrinos are massive, and may thus possess a non-null magnetic moment.

The limits of the effective magnetic moment of Solar neutrinos can be obtained studying the deviations from the standard shape of the electron recoils in neutrino-electron scattering. Recent improvements of the description of the Borexino energy scale allowed to include the low energy part of the neutrino spectrum in the analysis, namely the pp-neutrino contribution, improving significantly the sensitivity to the non-standard contributions in the weak ν -e scattering. Applying independent constraints on the neutrino fluxes from the radiochemical experiments, we obtain the best up-to-date limit of the effective magnetic moment of Solar neutrinos.

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