

Effective magnetic moment limit from Borexino Phase-II data

Non-zero neutrino magnetic moment is allowed by the Standard model and is proportional to the neutrino mass. It contributes to the cross section of the elastic scattering process at low energies, thus, can be studied at low-threshold neutrino experiments. Borexino detector has a high sensitivity to magnetic properties of solar neutrinos due to its unprecedentedly low residual radioactivity level and the energy threshold on recoil electrons about 180 keV. A limit on the effective neutrino magnetic moment of solar neutrinos has been obtained using the 1291.5 days data set acquired during the second phase of the experiment. Using this result, upper limits on magnetic moments of mass and flavor eigenstates of neutrinos have also been obtained.

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