

Magnetic moment of the neutrino

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A short review of theory and phenomenology of neutrino electromagnetic properties is given. The general structure of the Dirac and Majorana neutrinos electromagnetic interactions is discussed. Constraints on neutrino magnetic moments from the terrestrial laboratory experiments and astrophysical observations are reviewed. Special credit is done to bounds obtained by the reactor (MUNU, TEXONO and GEMMA) and solar Super-Kamiokande and the Borexino, and the recent COHERENT experiments. The best world experimental bounds on neutrino magnetic moments are confronted with predictions of theories beyond the Standard Model. The history and present status of neutrino spin and spin flavor oscillations induced by the neutrino magnetic moment interaction with a magnetic field is reviewed. The importance of neutrino spin oscillations for neutrino phenomenology in astrophysics is underlined. We also discuss a new effect of neutrino magnetic moment interaction with the transversal magnetic field on neutrino flavor oscillations. The prospects in studies of neutrino magnetic moments with future large-volume liquid-scintillator detectors experiments are discussed.

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