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Wave packet approach for description of Majorana neutrino oscillations in a magnetic field

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Majorana neutrino oscillations in a magnetic field are considered using the wave packets formalism. The dispersion relation for neutrinos with non-zero transition magnetic moments propagating in a magnetic field is found in the two flavour case. It is shown that for Majorana neutrinos propagating in a magnetic field the coherence length coincides with the coherence length for neutrino oscillations in vacuum when the vacuum frequency is much greater than the magnetic frequency, while it is proportional to the cube of the average neutrino momentum if. We show that the decoherence effect may appear during neutrino propagation in a magnetic field of supernova.

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