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Neutrino spin and spin-flavour oscillations in transversal matter currents with standard and non-standard interactions

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After a brief history of two known types of neutrino mixing and oscillations, including neutrino spin and spin-flavour oscillations in the transversal magnetic field, we perform systematic study of a new phenomenon of neutrino spin and spin-flavour oscillations engendered by the transversal matter currents on the bases of the developed quantum treatment of the phenomenon. Possibilities for the resonance amplification of these new types of oscillations by the longitudinal matter currents and longitudinal magnetic fields are analyzed. Neutrino spin-flavour oscillations engendered by the transversal matter currents in the case of nonstandard interactions of neutrinos with background matter are also considered.

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