THE DISTINCTIVE FEATURE OF WEAK INTERACTIONS AND SOME OF ITS SUBSEQUENCES (IMPOSSIBILITY OF GENERATION OF MASSES AND ABSENCE OF THE MSW EFFECT)

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In the Quantum theory the wave functions form a full and ortonormalized functional space. For this reason we can use the equation on eigenfunctions and eigenstates and find the eigenenergies E_n and eigenfunctions Ψ_n to determine the physical characteristics of the considered systems (or models). In the Quantum theory the observed values are the average value of operators. Since the wave functions create a full and ortonormalized space, the average values of operators coincide with eigenvalues of operators. This situation takes place in the case of strong and electromagnetic interactions. However, the average values of the weak interaction operators are equal to zero since only the left-handed components of spinors participate in the weak interactions. It means that in these interactions the connected states cannot exist. Then the weak interaction of the particles (scatterings, decays) can be considered only in the framework of the standard perturbative approach. It is shown that the weak interactions cannot generate masses and the equation for Green's function of the weak interacting fermions (neutrinos) in the matter coincides with the equation for Green's function of fermions in vacuum. And in the result we come to a conclusion: the mechanism of resonance enhancement of neutrino oscillations in matter (i.e. MSW effect) cannot exist.