NEUTRINO OSCILLATION IN GRAVITATIONAL FIELD

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Abstract
In order to get the probability of neutrino oscillations, neutrino phase equations have been derived assuming a plane wave approach. Derivation of the phase equation have been done in two ways: following the path of light neutrinos and follow the geodesic trajectory. Neutrino propagation in Schwarzschild spacetime is similar to the case of non-radial and radial-phase derivation was found that the results for geodesic trajectories two times larger than the calculated phase for the path of light. The results are used to calculate the derived phase of the phase of the wave function of neutrino propagation in the Schwarzschild spacetime and de-Sitter. For the radial case, the Schwarzschild spacetime is so small that the second term can be ignored and taken the first term only. For the case of non-radial curvature effects contribute. For the case of radial space-time de-Sitter results of the second term becomes important for the case of the neutrino source is located very far away, as the source of the supernova similar to the motion of non-radial curvature effects contribute little to the phase.

Keywords: neutrino oscillations, the trajectory of light, geodesic trajectory, the Schwarzschild spacetime and the space-time de-Sitter
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