



Contribution ID: 205

Type: Poster

Relating quantum mechanics and kinetics of neutrino oscillations

While oscillations of solar neutrinos are usually studied using single-particle quantum-mechanical approach, flavor conversion of supernovae neutrinos is typically analyzed using kinetic equation for the matrix of densities due to necessity to include also scattering processes. The kinetic equation is believed to be in conflict with the uncertainty principle and unable to account for the effect of wave packet separation. We establish a connection between the quantum-mechanical and kinetic approaches to neutrino oscillations and show that the uncertainty, as well as the Pauli, principles can be accounted for also in the kinetic approach by considering initial conditions consistent with these fundamental quantum principles. Such initial conditions can be constructed e.g. by setting the matrix of densities equal to the (reduced) single-particle Wigner function computed using initial conditions for the neutrino wave functions.

Mini-abstract

Uncertainty and Pauli principles in kinetic approach to neutrino oscillations via initial conditions

Primary author: Dr KARTAVTSEV, Alexander (P.G. Demidov Yaroslavl State University)

Presenter: Dr KARTAVTSEV, Alexander (P.G. Demidov Yaroslavl State University)

Session Classification: Poster Session 1