



Contribution ID: 589

Type: **Parallel session talk**

## What can the forthcoming large neutrino detectors tell us about flavor transitions of galactic supernova neutrinos?

*Wednesday, 23 August 2023 08:30 (20 minutes)*

We present a method to verify Mikheyev-Smirnov-Wolfenstein effect during the propagation of SN neutrinos from the SN core to the Earth. The non-MSW scenario to be distinguished from the MSW one is the incoherent flavor transition probability for neutrino propagation in the vacuum. Our approach involves studying time evolution of neutrino event rates in liquid Argon, liquid scintillation and water Cherenkov detectors. Using currently available simulations for SN neutrino emissions, the time evolution of  $\nu_e$  Ar event rates and  $\bar{\nu}_e$  inverse beta-decay event rates and the corresponding cumulative event fractions are calculated up to  $t=100$  ms in DUNE, JUNO and Hyper-Kamiokande detectors, respectively. It is shown that the area under the cumulative time distribution curve from  $t=0$  to  $t=100$  ms in each detector and their ratio can be used to discriminate different flavor transition scenarios of SN neutrinos.

### Collaboration / Activity

individual paper

**Primary author:** LIN, Guey-Lin (National Yang Ming Chiao Tung University)

**Co-authors:** Prof. LAI, Kwang-Chang (Center for General Education, Chang Gung University); Mr LEUNG, Jason (National Yang Ming Chiao Tung University)

**Presenter:** LIN, Guey-Lin (National Yang Ming Chiao Tung University)

**Session Classification:** T04 Neutrino Physics

**Track Classification:** Neutrino Physics