

Seminário, Terça 16/04/2024 16:00h

Local: Auditório DRCC

Yago Porto Silva (UFABC)

Título: Resonances of Supernova Neutrinos in Twisting Magnetic Fields

Abstract: We investigate the effect of resonant spin conversion of the neutrinos induced by the geometrical phase in a twisting magnetic field. We find that the geometrical phase originating from the rotation of the transverse magnetic field along the neutrino trajectory can trigger a resonant spin conversion of Dirac neutrinos inside the supernova, even if there were no such transitions in the fixed-direction field case.

We have shown that, even though resonant spin conversion is too weak to affect solar neutrinos, it could have a remarkable consequence on supernova neutronization bursts where very intense magnetic fields are quite likely.

We demonstrate how the flavor composition at Earth can be used as a probe to establish the presence of non-negligible magnetic moments, potentially down to $10^{-15} \mu_B$ in upcoming neutrino experiments like the Deep Underground Neutrino Experiment and the Hyper-Kamiokande.

Possible implications are analyzed.