Contribution ID: **19** Type: **not specified**

Particle oscillations in collapse models

Thursday, 21 June 2012 12:30 (30 minutes)

Collapse models are phenomenological models developed to solve the measurement problem in Quantum Mechanics. In these models one assumes that the evolution of the wave function is driven by an equation obtained introducing new non-linear and stochastic terms in the Schr?dinger equation.
Accordingly, collapse models make different predictions than Quantum Mechanics, so they can be tested.
A phenomenon that could be used, in principle, to test the collapse models is particle oscillations. This oscillation is observed when the flavor eigenstates of a particle, that are the ones usually founded when a measurement is performed, have not definite mass. In such a case it is supposed that the flavour eigenstates are superposition of the mass eigenstates. Since each of the mass eigenstates has a different time evolution, there is a non zero probability that an initial flavour eigenstate ends up in a different flavour eigenstate after some time t. This phenomenon has been studied in Quantum Mechanics, and it has been shown that these probability oscillate. We analyzed the effects of collapse models in particle oscillations, focusing our attention in particular on neutrinos and kaons. We have shown that the effect of the collapse is to damp this oscillation behavior with an exponential factor.

Presenter: DONADI, Sandro (TS)

Session Classification: Part III