Contribution ID: **32** Type: **not specified**

Viable fit to neutrino observables in possible U(2) flavor models

Tuesday 1 July 2025 16:30 (20 minutes)

The explanation of neutrino masses and mixing still represents one of the open questions of the so-called "SM flavor puzzle"today. The purpose of my work is to provide a possible explanation of this problem, introducing an extension of the Standard Model based on a continuous $U(2)$ flavor symmetry (which is locally isomorphic to $SU(2) \times U(1)$), indicated as $U(2)_F$. This symmetry is spontaneously broken by the VEVs of two scalar fields, called *flavons*. Since the flavon VEVs depend on small parameters $\epsilon_{\phi,\chi} \sim O(0.01)$, all hierarchies in fermion masses and mixings arise from powers of these small order parameters.
Assuming that neutrinos are Majorana particles and that the light neutrinos take mass via the type-I see-saw mechanism, we can obtain a list of possible structures for the neutrino mass matrix (which we call *patterns*), depending on the choice of the $U(2)_F$ quantum numbers for the three RH neutrino representations.
After a numerical fit of this matrices to the neutrino observables, we obtain 13 viable patterns, which provide us interesting predictions on neutrino observables, such as the effective electron neutrino mass m_β and the effective Majorana neutrino mass $m_{\beta\beta}$, and also on BSM phenomena such as LFV decays.

Author: RETTAROLI, Mirko (Istituto Nazionale di Fisica Nucleare)

Presenter: RETTAROLI, Mirko (Istituto Nazionale di Fisica Nucleare)

Session Classification: Parallel session I