

## **Non-standard neutrino oscillations: perspective from unitarity triangles**

*Monday, 30 August 2021 17:25 (15)*

We formulate an alternative approach based on unitarity triangles to describe neutrino oscillations in presence of non-standard interactions (NSI). Using perturbation theory, we derive the expression for the oscillation probability in case of NSI and cast it in terms of the three independent parameters of the leptonic unitarity triangle (LUT). The form invariance of the probability expression (even in presence of new physics scenario as long as the mixing matrix is unitary) facilitates a neat geometric view of neutrino oscillations in terms of LUT. We examine the regime of validity of perturbative expansions in the NSI case and make comparisons with approximate expressions existing in literature. We uncover some interesting dependencies on NSI terms while studying the evolution of LUT parameters and the Jarlskog invariant. Interestingly, the geometric approach based on LUT allows us to express the oscillation probabilities for a given pair of neutrino flavours in terms of only three (and not four) degrees of freedom which are related to the geometric properties (sides and angles) of the triangle. Moreover, the LUT parameters are invariant under rephasing transformations and independent of the parameterization adopted.

### **Reference to paper (DOI or arXiv)**

10.1007/JHEP05(2021)171

### **Your gender (free text)**

Female

**Primary author(s)**: MASUD, Mehedi (IFIC, Valencia); MEHTA, Poonam (Jawaharlal Nehru University); TERNES, Christoph Andreas (INFN, Sezione di Torino); TÓRTOLA, Mariam (IFIC (CSIC-Univ. Valencia))

**Presenter(s)**: MEHTA, Poonam (Jawaharlal Nehru University)

**Session Classification** : Discussion Panel Neutrinos 1

**Track Classification** : Neutrino physics and astrophysics