Contribution ID: **301** Type: **Poster etc.**

Disentangling genuine CP violation from matter effects in neutrino oscillations

We propose a criterion to disentangle genuine from matter-induced CP violation in neutrino oscillations, based solely on symmetry principles. We prove a theorem establishing that, in any flavor channel, neutrino oscillation CP asymmetries have two contributions that are profoundly different: a CPT violating term that vanishes in vacuum and a T violating term that vanishes, even in matter, if there is no CP violation in vacuum. The CPT violating term is T invariant and the T violating term is CPT invariant, so they become solid observables to separately test (a) matter effects that violate CPT and (b) genuine CP violation in the neutrino sector, respectively. The (CPV, T-invariant, CPTV) is an even function of the baseline, whereas the (CPV, TRV, CPT-invariant) is odd. We exploit the symmetry implications in writing these two terms in the CP asymmetry as analytical approximations up to first order in $\Delta m^2_{21} < |\Delta m^2_{31}|$ and $|U_{e3}| < 1$ as an illustration.

Session and Location

Wednesday Session, Poster Wall #141 (Hölderlin-Room)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)