

Sufficient and necessary conditions for CP conservation with Majorana neutrinos

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As is well-known, there exist totally three CP-violating phases in the leptonic sector if three ordinary neutrinos are massive Majorana particles. In this talk, we raise the question whether the number of sufficient and necessary conditions for CP conservation in the leptonic sector with massive Majorana neutrinos is three or four. An intuitive answer to this question would be three, which is also the total number of independent CP-violating phases. However, we give a counter example, in which three conditions are in general not sufficient for CP conservation. Only for all the lepton masses and mixing angles within their experimentally allowed ranges can we demonstrate that it is possible to find out three weak-basis invariants, which should be vanishing to guarantee leptonic CP conservation.

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