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An effective theory of neutrino: New physics contribution to neutrinoless double beta decay and its origin

It is expected that currently on-going experiments (and more planned in near future) will reveal various aspects of neutrino mass: Precision cosmology in the post WMAP era places a strong constraint on gravitational property of neutrino. Neutrinoless double beta decay experiments aim at identifying its basic nature (Dirac or Majorana). With long baseline oscillation experiments, we have a chance to know the type of mass hierarchy. All of them are going to test the standard three-generation neutrino framework. If the experimental results will make a conflict with each other, we will need some new physics beyond “the standard neutrino model”.

In this presentation, we discuss a new physics contribution to neutrinoless double beta decay process, which can be parametrized as effective operators. With “the exhaustive bottom-up approach” we explore systematically the relation between the effective operators and their high energy (TeV scale) completions.

We also discuss the possible relation between the neutrinoless double beta decay operators and the origin of neutrino mass.

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