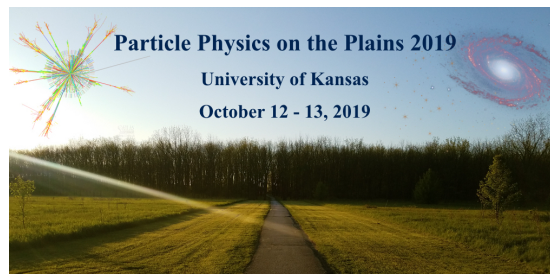


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Minimal Dirac Neutrino Mass Models from Generic One-loop and Two-loop Topologies

Sunday 13 October 2019 12:10 (20 minutes)

We carry out a systematic investigation of the minimal Dirac neutrino mass models emerging from generic one-loop and two-loop topologies that arise from $d = 5$ effective operator with a singlet scalar, σ . To ensure that the tree-level Dirac mass, as well as Majorana mass terms at all order are absent for the neutrinos, we work in the framework where the Standard Model is supplemented by the well motivated $U(1)_{B-L}$ gauge symmetry. At one-loop level, we analyze six possible topologies, out of which two of them have the potential to generate Dirac neutrino masses. Adopting a systematic approach to select minimal models, we construct 18 viable one-loop Dirac neutrino mass models. By repeating a similar methodical procedure at two-loop, we have worked out 22 minimal candidates. Among these 40 economical models, majority of the models proposed in this work are new. In our search we have also included the scenarios where the particles in the loop carry charges under color.

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