



Contribution ID: 51

Type: parallel talk

Right-handed neutrinos and T-violating, P-conserving interactions

Monday 9 May 2016 18:15 (15 minutes)

We revisited the theoretical implications of the study of the so-called D -coefficient which is a P-conserving and T-violating correlation in the polarized neutron beta decay. While existing literature argued that any operator that generates this coefficient will inevitably generate various electric dipole moments in loop level and the latter set a much stringent bound than the direct detection, we pointed out that there exists a class of dimension-6 operators involving right-handed neutrinos that contribute to this correlation in second order and receive no stringent bound from current upper bounds of electric dipole moments. Assuming a natural size of the dimensionless Wilson coefficients, the current upper bound on the neutron D -coefficient implies a new physics scale of $\Lambda > 1\text{TeV}$.

Summary

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Session Classification: Neutrinos