

Neutron EDM in Four Generation Standard Model

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New experiments under construction aim to push neutron electric dipole moment down by one to two orders of magnitude, to an eventual sensitivity of 10^{-28} e cm. The Standard Model would still be out of reach. However, there is renewed interest in the direct search for a possible fourth generation of quarks, which may carry sufficient CP violation for the baryon asymmetry of the Universe. We estimate the neutron EDM in the presence of a fourth generation, and find it would be dominated by the strange quark chromoelectric dipole moment, assuming it does not get wiped out by a Peccei-Quinn symmetry. The three electroweak loop contribution is comparable in strength to the two-loop electroweak/one-loop gluonic contribution. With $m_{b'}$, $m_{t'}$ at 500 GeV or so, and with a Jarlskog CPV factor that is consistent with hints of New Physics in $b \rightarrow s$ transitions, the neutron EDM is still far below 10^{-28} e cm.

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