Contribution ID : 30

## Chromomagnetic and chromoelectric dipole moments of the top quark in the 4GTHDM

## Abstract

The contributions to the chromo magnetic dipole moment (CMDM) and chromo electric dipole moment (CEDM) of the top quark are calculated at the one-loop level in the framework of the two-Higgs doublet model with four fermion generations (4GTHDM), which is still consistent with experimental data and apart from new scalar bosons and fermions predicts new sources of CPviolation via the extended  $4 \times 4$  CKM matrix. Analytical expressions for the CMDM and CEDM of a quark are presented both in terms of Feynman parameter integrals and Passarino-Veltman scalar functions, with the new contributions arising from loops carrying the scalar bosons accompanied by the third- and fourth-generation quarks. The current bounds on the parameter space of the 4GTHDM are discussed and a region still consistent with the LHC data on the 125 GeV Higgs boson is identified. It is found that in such a region the top quark CMDM, which receives contributions from all the scalar bosons, can reach values of the order of  $10^{-4} - 10^{-3}$ , with the dominant contribution arising from the fourth generation quarks, though all the partial contributions may also interfere destructively for some parameter values, thereby giving a negligible CMDM. As for the top quark CEDM, it only receives contributions from the charged scalar boson and can reach values of the order of  $10^{-18}$  ecm for relatively light  $m_{H^{\pm}}$  and large  $m_{b'}$ . The latter would be an interesting prediction of this model.

**Primary author(s) :** Mr. HERNÁNDEZ JUÁREZ, Alan Ignacio (BUAP); Dr. TAVARES-VELASCO, Gilberto (Benemérita Universidad Autónoma de Puebla); Dr. MOYOTL-ACUAHUITL, Agustin (Cinvestav)

**Presenter(s) :** Mr. HERNÁNDEZ JUÁREZ, Alan Ignacio (BUAP)