

Can we constrain anomalous magnetic and/or electric dipole moments of tau lepton from $PbPb \rightarrow PbPb\tau^+\tau^-$ reaction at the LHC ?

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We will discuss the sensitivity of the $\gamma\gamma \rightarrow \tau^+\tau^-$ process in ultraperipheral Pb+Pb collisions on the anomalous magnetic moment of τ lepton (a_τ) at LHC energies. We derive the corresponding cross sections by folding the elementary cross section with the heavy-ion photon fluxes and considering semi-leptonic decays of both τ leptons in the fiducial volume of ATLAS and CMS detectors. We present predictions for total and differential cross sections, and for the ratios to $\gamma\gamma \rightarrow e^+e^-(\mu^+\mu^-)$ process. These ratios allow to cancel theoretical and experimental uncertainties when performing precision measurement of a_τ at the LHC. The expected limits on a_τ with existing Pb+Pb dataset are found to be better by a factor of two comparing to the current best experimental limits and can be further improved by another factor of two at High Luminosity LHC. In addition, our results for tau lepton electric dipole moment, d_τ , can be competitive with the current best limits that were measured by Belle experiment.

Secondary track (number)

07

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