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Probing the dipole moments of the tau-neutrino at high-energy γe^- and $\gamma\gamma$ collisions: ILC and CLIC

In this work we study the potential of the processes $e^+e^- \rightarrow e^+\gamma e^- \rightarrow e^+\tau\bar{\nu}_\tau\nu_e$ and $e^+e^- \rightarrow e^+\gamma\gamma e^- \rightarrow e^+\nu_\tau\bar{\nu}_\tau e^-$ at a future high-energy and high-luminosity linear electron positron collider, such as the ILC and CLIC to study the sensibility on the anomalous magnetic and electric dipole moments of the tau-neutrino. For integrated luminosity of 590 fb^{-1} and center-of-mass energy of 3 TeV , we derive 95% C. L. limits on the dipole moments: $\mu_{\nu_\tau} \leq 1.44 \times 10^{-6} \mu_B$ and $d_{\nu_\tau} \leq 2.78 \times 10^{-17} \text{ e cm}$ in the γe^- collision mode and of $\mu_{\nu_\tau} \leq 3.4 \times 10^{-7} \mu_B$ and $d_{\nu_\tau} \leq 6.56 \times 10^{-18} \text{ e cm}$ with the $\gamma\gamma$ collision mode, improving the existing limits.

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