mixing leads to clear LFV signals in slepton and sneutrino production and in the decays of neutralinos and charginos into sleptons and sneutrinos at hadron colliders and lepton colliders [9]. The non-universal U(1) gauge bosons Z', which are prediced by various specific models beyond the SM, can lead to the large tree-level flavor changing(FC) couplings. Thus, these new particles may have significant contributions to some LFV processes [10].

The key feature of TC2 models [6] and flavor-universal TC2 models [11] is that the large top quark mass is mainly generated by topcolor interactions at a scale of order 1 TeV . The topcolor interactions may be flavor non-universal (as in TC2 models) or flavor-universal (as in flavor-universal TC2 models). However, to tilt the chiral condensation in the $t\bar{t}$ direction and not form a $b\bar{b}$ condensation, all of these models need a non-universal extended hypercharge group $U(1)$. Thus, the existence of the extra $U(1)$ gauge bosons Z' is predicted. These new particles treat the third generation fermions (quarks and leptons) differently from those in the first and second generations, namely, couple preferentially to the third generation fermions. After the mass diagonalization from the flavor eigenbasis into the mass eigenbasis, these new particles lead to tree-level FC couplings. The flavor-diagonal couplings of the extra $U(1)$ gauge bosons Z' to ordinary fermions, which are related to our calculation, can be written as [6, 12]:

$$\mathcal{L} = -\frac{1}{2}g_1\{\tan\theta'\{(\bar{e}_L\gamma^\mu e_L + 2\bar{e}_R\gamma^\mu e_R + \bar{\mu}_L\gamma^\mu\mu_L + 2\bar{\mu}_R\gamma^\mu\mu_R) + \cot\theta'(\bar{\tau}_L\gamma^\mu\tau_L + 2\bar{\tau}_R\gamma^\mu\tau_R)\}\cdot Z'_\mu \tag{1}$$

where g_1 is the ordinary hypercharge gauge coupling constant. θ' is the mixing angle and $\tan\theta' = \frac{g_1}{2\sqrt{\pi K_1}}$ where K_1 is the coupling constant.

The flavor-changing couplings of the extra $U(1)$ gauge bosons Z' to ordinary fermions, which are related to our calculation, are given in the followings: [6, 12]:

$$\mathcal{L} = -\frac{1}{2}g_1\{K_{\mu e}(\bar{e}_L\gamma^\mu\mu_L + 2\bar{e}_R\gamma^\mu\mu_R) + k_{\tau\mu}(\bar{\tau}_L\gamma^\mu\mu_L + 2\bar{\tau}_R\gamma^\mu\mu_R) + k_{\tau e}(\bar{\tau}_L\gamma^\mu e_L + 2\bar{\tau}_R\gamma^\mu e_R)\}\cdot Z'_\mu, \tag{2}$$

where $k_{\mu e}$, $k_{\tau e}$ and $k_{\tau\mu}$ are the flavor mixing factors. Since the new gauge boson Z' couples preferentially to the third generation, the factor $K_{\mu e}$ are negligibly small, so in the following estimation, we will neglect the $\mu - e$ mixing, and consider only the flavor changing coupling processes $\gamma\gamma \to \tau\bar{\mu}$ and $\gamma\gamma \to \tau\bar{e}$.

Note that the difference between the $Z'\tau\bar{\mu}$ and $Z'\tau\bar{e}$ couplings lies only in the flavor mixing factor $K_{\tau\mu}$ and $K_{\tau e}$ and the masses of the final state leptons. Since the non-universal gauge