

Analysis of Anomalous TDE Data on-board the KITSAT-1

Young-Hoon Shin, Kyoung-Wook Min, Jin Geun Rhee, and Dae-Hee Lee
Department of Physics and Satellite Technology Research Center, KAIST

The peculiar behavior observed in the TDE (Total Dose Experiment) on board the KITSAT-1 is presented in this paper. This anomaly is identified as the thermal effect due to the change in the eclipse rate of the satellite. Similar behavior is seen in the laboratory experiment as the temperature of the RADFET, the TDE sensor, is varied from 20oC to 80oC while it is being irradiated with Co60 -ray source. Present study focuses on the modeling effort of separating the thermal effect from this complicated behavior. We calculate the oxide trap and interface trap charges from the non-thermal irradiation data, and then include the thermal annealing for the oxide charges and the conversion into the interface states. The result enables us to fit the experimental data successfully and thereby, estimate the pure radiation effect on TDE experienced in space.