

W243c Statistical Correlation of Satellite Anomalies and Space Weather

Mehmet Kaplan & Murat Hudaverdi (Yildiz Technical University)

The space is a very harsh environment for electronics and satellite components. Solar activities has a major effect to trigger energetic particles. In this work, we analyze and evaluate statistical correlation by using the RASAT (Turkish 2nd remote sensing satellite) log files. We review operational anomalies of RASAT, by assessing the identification and estimation of potential source of space weather agents. A number of severe solar flares have been reported by NAOO since RASAT was launched on August 2011. We obtained the proton and electron flux levels from archival GOES-13 satellite. In parallel, we also estimated the flux values by Spenvis algorithm for comparison. RASAT was monitored regularly and all key parameters are logged in order to track operational values and alert if anything goes beyond the thresholds. Both tables are compared by superposed epoch analysis technique. Possible similarities or dissimilarities in fluctuations are interpreted for better understanding of space environment and its effects on electronics. We have detected four dates (November 2011, February 2012, July 2012, December 2012) in which RASAT performed severe corrections. Space weather conditions for the dates are checked by mainly focusing on the solar energetic particle flux variations. The year 2013 data is also being monitored in the same routine. We try to understand underlying mechanisms of failure and anomalies. The results hopefully enable Turkish engineers, designers and scientists to efficiently eliminate the risk, minimize the cost, and optimize the design for future national space missions.