

42nd SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES (D5)
Preventing Spacecraft Failure From Space Environment Effects (3)

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INFLUENCE OF SPACE WEATHER ON THE GEOSTATIONARY SATELLITE ANOMALIES IN THE
PERIOD 1997 – 2008

Abstract

Space weather effects on modern spacecraft systems have been emphasized more and more as increasing complexity and capability. Energetic charged particles potentially can destroy and degrade electronic components in satellites. However, bad correlation between space storm index and anomaly occurrences have disappointed us in protecting satellite by forecasting space weather. In this presentation, we analyzed the geostationary satellite anomalies in the period 1997 – 2008 to search possible influence of space weather. Our analysis also showed bad correlation between geomagnetic index and anomaly occurrences, but good correlation with energetic electron flux increase due to arrival of high speed solar wind stream during solar minimum period. This result implies we can anticipate severe space weather by monitoring solar wind. In addition, satellite anomalies occurred more preferentially in the mid night and dawn sector than noon and dusk sector. While we could not identify which factors caused such local time dependences, these results should be taken into account in operating satellites.