Measurements of space radiation environment in low earth orbit from 2006 through 2011

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The Technical Data Acquisition Equipment (TEDA) on board the Daichi satellite (Advanced Land Observing Satellite: ALOS) was launched on 24 January 2006, and had been operated at 700 km altitude with 98 degree inclination until 21 April 2011. The TEDA consists of the Light Particle Telescope (LPT) for measurements of energetic electrons, protons, and alpha-particles, as well as the Heavy Ion Telescope (HIT) for observations of energetic ions from helium to iron. In low earth orbit, the proton radiation environment is composed of the SAA (South Atlantic Anomaly) region that is settled by the combination of the distribution of geomagnetic field and trapped protons in the inner radiation belt, and the proton components in galactic cosmic rays that distribute along with the geomagnetic cut-off rigidity distribution. The electron radiation environment has also the horn region that corresponds to the foot points of the outer radiation belt as well as those two components. The operation period of the Daichi satellite was through the solar-activity minimum period so that the space radiation environment around the Daichi satellite had been almost stable. However, large solar flares followed by CMEs sometimes occurred in this period, and disturbed the space radiation environment in the orbit of the Daichi satellite. The enhancements of proton and electron flux due to the solar events were measured both in the polar and the horn regions. In addition, high speed solar wind often flowed during this period. The modulation of electron flux due to the solar wind variations was measured in the horn region. On the other hand, a little variation was seen in the SAA region. In this presentation, the space radiation environment in low earth orbit measured by the Daichi satellite from 2006 through 2011 in comparison with the calculation results obtained from usual space radiation models is reported.