

PEM027-06

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Electron Radiation Belt Model Varying Through The Solar Cycle Using Akebono Satellite

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The radiation belts are regions of high-energy particles, mainly protons and electrons, trapped by the Earth's magnetic field. The radiation belt models are important for the design and operation of spacecrafts because the high-energy particles can damage the satellites, e.g., directly by single event effects and on prolonged exposure, and can be a hazard to astronauts. The annual averaged high-energy electron flux of the radiation belt varies with solar activities which undergo 11-year solar cycles. We have examined the variations of the electron radiation belts with the solar and magnetospheric activities using data from the Radiation Monitor (RDM) of the Akebono satellite. The Akebono satellite has been in the highly elliptical low Earth orbit over the last two decades and measured the almost whole region of the inner belt and the high latitude region of the outer belt. We have proposed the new electron radiation belt model varying through the solar cycle based on the unique measurement of the Akebono satellite, which has been continuously done for almost two solar cycles.

Keywords: Electron radiation belt model, Akebono satellite, Solar cycle