

On the spatial evolution of energetic electrons in the upper atmosphere over different phases of two solar cycles

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The Earth's radiation belt (ERB) is a significant hurdle to the safe operation of space vehicles owing to the precipitation of energetic particles, leading to ionisation in the ionosphere and the upper atmosphere. We present results from a long term study, covering two solar cycles, the dynamics of electron fluxes at altitudes of 850kms. We show an equatorward shift of the electron precipitation from the outer ERB in the Siberian region. In the South Atlantic Anomaly, we demonstrate a substantial decrease in the area and fluxes from the 23rd to the 24th solar cycle. Finally, we elucidate that such dynamics can be explained by the variations in the geomagnetic activity and the continual and noticeable change in the Earth's magnetic field during the 24th solar cycle.

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