

UV Airglow and Electron Precipitation

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We studied experimental data on ultra-violet (UV) air-glow with wavelength 300 – 400 nm and energetic electrons measured by low-altitude polar satellite Universitetskii-Tatiana. Statistical analysis of the data allowed revealing three latitudinal regions of the UV emission enhancements: equatorial ionization anomaly, mid-latitude region of quasi-trapped electron precipitation, and high-latitude region of auroral precipitations. Modeling the electron precipitations to the atmosphere gave numerical estimation of the generated UV radiation. We found that the precipitation can explain the observed UV enhancements only at high latitudes, in the regions of outer radiation belt and aurora. Stable and quasi-stable fluxes of electrons precipitating at middle and low latitudes are too weak to explain the observed UV radiation. A mechanism of the mid-latitude UV enhancements is proposed as a subject of further investigations.