



Observations of the trapped and precipitating ionizing radiation from the LEO orbit

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We discuss the observations of the locally trapped and precipitating particles from the LEO orbit. Observations from this vantage point provide a unique opportunity to resolve the drift and bounce loss cone, understand the loss processes in the radiation belts and measure precipitating fluxes that can change upper atmospheric chemistry. We report on the first results obtained from the Electron Losses and Fields INvestigation on board the Lomonosov satellite (ELFIN-L). The main objective of the project is to determine the rate of storm-time relativistic electron precipitation during geomagnetic storms and to understand the mechanisms responsible for the precipitation. ELFIN-L provides in-situ measurements of the trapped electron fluxes and electron fluxes in the loss cone over the period of six months from June until December 2016. Orientation of the ELFIN-L instruments allows us to sample both trapped and precipitating fluxes on a three-axis stabilized spacecraft. By measuring the electron precipitation rate and determining the dominant loss mechanism of relativistic electrons during storms, ELFIN-L allows us to quantify electron losses as a function of energy for use in global predictive models of the near-Earth radiation environment.