

Pulsating Aurora and the MAPLE Sounding Rocket Experiment

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Pulsating aurora is typically observed after auroral breakup in the post-midnight region. It occurs in patches spanning tens to hundreds of km and is characterized by quasi-periodic of brightness modulations with periods of ~8 seconds on average. This aurora is generally quite dim, often sub-visual, with typical brightness in the range of hundreds of R to a few kR in the 427.8 nm emission. Occurrence rates of nearly 60% during solar minimum are typical, with many events lasting 9 hours and longer. Pulsating aurora has long been associated with “electron microbursts”, a signature that has gradually changed and is now used to describe one aspect of radiation belt precipitation, although the possible connection between pulsating aurora and radiation belts has never been made. The goal of the Microburst Auroral Pulsation Loss Experiment (MAPLE) sounding rocket is to explore that connection, including the possibility of acquiring data in conjunction with the Exploration of energization and Radiation in Geospace (ERG) satellite. Working together with ERG and ground-based instruments, the main objective of MAPLE is to answer the questions relating microbursts to optical signatures of pulsating aurora.