

Auroral Spatial Structures Probe (ASSP)

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The Auroral Spatial Structures Probe (ASSP) is a NASA sounding rocket mission to be launched in the late January 2015 time frame that will be used to study both the spatial and temporal small scale variation of the electric and magnetic fields during active aurora and just before the onset of an auroral sub-storm. This will be accomplished through the use of a constellation of small payloads that separate relative to each other throughout a sounding rocket flight.

The high altitude rocket will be launched along the magnetic field line and carry six sub-payloads to be ejected from the main payload at high velocity. Sub-payloads will be deployed both perpendicular to and along the main flight path, which provides repeated sampling of the same spatial points and allows temporal-spatial ambiguities to be resolved. The low-mass sub-payloads which will achieve at least a 35 km separation by the end of the flight are key to observational success. Each sub-payload will carry a crossed pair of double-probe sensors to measure in-situ electric fields, a three axis magnetometer, a Langmuir probe and a GPS receiver. The multiple baseline observations of the electric and magnetic fields will be used to observe variability of both the E-field and the Poynting flux.

These observations will be placed in the context of available data, including winds, large scale E-fields, and proxy conductivity (airglow images) observations. In this way we will address the main scientific objective of this mission which is: What are the contributions of small spatial scale and rapid temporal scale fluctuations of electric fields relative to the larger-scale electrodynamic processes? In this presentation we review the ASSP science, mission, and design, and present preliminary instrument performance and calibration data.