SS-520-3 Sounding Rocket Experiment Targeting the Ion Outflow over the Cusp Region: Status Update

*Yoshifumi Saito[1], Yasunobu Ogawa[2], Hirotsugu Kojima[3]

1. Institute of Space and Astronautical Science, 2. National Institute of Polar Research, 3. Research Institute for Sustainable Humanosphere, Kyoto University

Although Japanese sounding rocket SS-520-3 was planned to be launched from Ny-Ålesund, Svalbard in Spitsbergen in December 2017, the launch was postponed at least by one year due to mal-function of the timer equipment that was found during the final stage of the integration test. The objectives of this sounding rocket are to understand the particle acceleration processes that cause the ion outflow by making in-situ observation of the wave-particle interaction over the dayside cusp region. The wave-particle interaction is going to be resolved by WPIA (Wave Particle Interaction Analyzer) that is newly developed for satellite missions. Since these wave-particle interactions are predicted to be effective above ~800km altitude, a two-stage sounding rocket SS-520 whose apex is higher than ~800km is necessary. The rocket range where SS-520 can be launched over dayside cusp is only SvalRak at Ny-Ålesund in Svalbard. This sounding rocket experiment is a part of the comprehensive observation campaign including ground-based radar (EISCAT Svalbard Radar) and optical observations. SS-520-3 sounding rocket experiment is also one of the projects participating to "A Grand Challenge Initiative (GCI) Cusp program" that is a large-scale international collaboration for targeting advancement in the common understanding of cusp region space physics through coordinated experimental and theoretical research using ground-based instruments, modeling, sounding rocket investigations, and satellite based instruments. All the science payloads of SS-520-3 was manufactured by the end of March 2016. Unit level environment test and calibration has been completed and they are ready for flight in winter 2018-2019.

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