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Introdution to GLIMS mission
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The Global Lightning and sprIte MeasurementS (GLIMS) on the International Space Station (ISS) is a mission to detect and locate optical transient luminous events (TLEs) and its associated lightning simultaneously from the non-sun synchronous orbit, and was launched successfully in July, 2013 as part of the multi-mission consolidated equipment on Japanese Exposure Module (JEM). Our mission goals are to identify temporal and spatial evolutions of lightning and TLEs and to clarify the occurrence conditions of TLEs and global occurrence locations and rates of TLEs from the nadir observation. To achieve these goals, two CMOS cameras, six Photometers, VLF receiver, and VHF interferometer with two antennas, are installed at the bottom of the module to observe the TLEs as well as causative lighting discharges at nadir direction during day and night time. Though the luminous events so-called sprite, elves and jets have been investigated by numerous researchers all over the world based mainly on the ground observations, some important problems have not been fully understood yet such as generation mechanisms of columniform fine structure and horizontal offset of some sprites from the parent lightning discharges. In the JEM-GLIMS mission, observations from our synchronized sensors are going to shed light on above-mentioned unsolved problems regarding TLEs as well as causative lighting discharges.

The optical instruments are two CMOS cameras (LSI-1, LSI-2) and six-channel spectrophotometers (PH1 - PH6). The FOV of LSI is 28.3 deg. x 28.3 deg., and LSI-1 (LSI-2) equips a 766-832 nm wide band filter (a 762+/-7 nm narrow band filter). Each PH channel equips the optical band-pass filter, and these photometers measure the N2 1P, N2 2P, N2 LBH, and N2+ 1N emissions of lightning and TLEs. The radio receivers consist of one VLF receiver (VLFR) and two sets of VHF receivers (VITF). In order to detect TLE-associated whistler waves, VLFR employs a nadir-directing monopole antenna and an electronics unit recording waveform data with a sampling frequency of 100 kHz with 14-bit resolution. VITF consists of two patch-type antennas separated by 1.5 m and an electronics unit, and VITF mainly observes VHF pulses in the frequency range of 70-100 MHz excited by lightning discharges with a sampling frequency of 200 MHz with 8-bit resolution.

JEM-GIMS was successfully launched and transported to the ISS by the H-II Transfer Vehicle (HTV) No.3 cargo transporter at the end of July 2012, and started its operation from December 2013. So far, more than one thousand events were recorded. In this presentation, mission history and overview will be given as an introdution.

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