

Preliminary observational results of the Ionosphere, Mesosphere, upper Atmosphere, and Plasmasphere mapping mission

Akinori Saito^{1*}, Atsushi Yamazaki², Takeshi Sakanoi³, Ichiro Yoshikawa⁴

¹Graduate School of Science, Kyoto University, ²JAXA/ISAS, ³PPARC, Tohoku University, ⁴The University of Tokyo

ISS-IMAP (Ionosphere, Mesosphere, upper Atmosphere, and Plasmasphere mapping) mission is a space-borne imaging mission to elucidate the Earth upper atmosphere, the mesosphere, the ionosphere, the thermosphere and the plasmasphere. It was launched in July 2012, and installed on the Exposed Facility of Japanese Experiment Module on the International Space Station, EF of ISS-JEM, in August 2012. The nominal observation started in the middle of October. It conducts imaging observation of the Earth's upper atmosphere with visible-light and infrared spectrum imager (VISI) and extra ultraviolet imager (EUVI). The objective of this mission is to clarify the physical mechanism of the following three processes: (1) energy transport process by the atmospheric structures whose horizontal scale is 50-500km in the upper atmosphere (2) process of the plasma transport up to 20,000km altitude (3) effect of the upper atmosphere on the space-borne engineering system. ISS-IMAP will measure the following three parameters in the lower latitude region than 50 degrees: (1) distribution of the atmospheric gravity wave in the mesopause (87km), the ionospheric E-region (95km), and the ionospheric F-region (250km) (2) distribution of the ionized atmosphere in the ionospheric F-region (3) distribution of O⁺ and He⁺ ions in the ionosphere and plasmasphere. VISI will observe the airglow of 730nm (OH, Alt. 85km), 762nm (O₂, Alt 95km), 630nm(O, Alt.250km) in the Nadir direction. EUVI will measure the resonant scattering of 30.4nm [He⁺] and 83.4nm [O⁺]. It points the limb of the Earth to observe the vertical distribution of the ions. The outline of the preliminary observation of the ISS-IMAP mission will be introduced in the presentation.

Keywords: Ionosphere, Mesosphere, Plasmasphere, Thermosphere, International Space Station, Kibo