

地球超高層大気撮像観測ミッション ISS-IMAPの現状と今後

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Current status and future plan of the ISS-IMAP mission

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ISS-IMAP (Ionosphere, Mesosphere, upper Atmosphere, and Plasmasphere mapping) mission is a scientific mission that will make imaging observation of the Earth's upper Atmosphere with two imaging instruments on the Exposed Facility of Japanese Experiment Module on the International Space Station (EF of ISS-JEM). It is one of the scientific and engineering missions of Multi-mission Consolidated Equipment (MCE) that will be attached on EF of ISS-JEM. Visible-light and infrared spectrum imager (VISI) will detect the airglow emission in the mesosphere and the thermosphere/ionosphere, and extra ultraviolet imager (EUVI) will detect the resonant scattering emission from the ions in the ionosphere and the plasmasphere. 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. Its field-of-view is two slits that have 90-degree width perpendicular to the trajectory of ISS, and direct forward and backward. The vertical structure of the airglow will be determined by stereo observation with these two slits. EUVI will measure the resonant scattering of 30.4nm [He⁺] and 83.4nm [O⁺]. Its field-of-view is 15 degrees, and points the limb of the Earth to observe the vertical distribution of the ions. The current status and the future plan of the ISS-IMAP mission will be reviewed in the presentation.