ISS-IMAPミッションとその宇宙天気研究への利用

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The ISS-IMAP mission and its space weather application

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The ISS-IMAP (Ionosphere, Mesosphere, upper Atmosphere, and Plasmasphere mapping) mission will make the imaging observation of the Earth’s upper atmosphere from the Exposed Facility of Japanese Experiment Module on the International Space Station (EF of ISS-JEM). It is scheduled to start observation in FY2011. 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. To elucidate these processes, ISS-IMAP consists of two imaging instruments, Visible and Infrared Spectral Imager (VISI) and Extreme Ultra Violet Imager (EUVI). VISI will measure the airglow of 630nm [O], 650nm [OH], and 762nm [O2] in the mesosphere and the ionosphere. Its field-of-view is in the nadir direction. EUVI will measure the resonant scattering of 30.4nm [He+] and 83.4nm [O+] of the plasmasphere. Its field-of-view is in the backward limb direction. ISS-IMAP will monitor the disturbances of the Earth’s upper atmosphere, and their effects on the space-borne systems of navigation and communication in the mid- and low-latitude regions. The coordinated study between the observation and the model is a key issue of the ISS-IMAP mission. In the presentation, the outline of the ISS-IMAP mission will be presented, and its application to the space weather studies will be discussed.