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国際宇宙ステーションからのスプライトと雷観測

Global Lightning and Sprite Measurements from ISS

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Lightning is an electrical discharge which neutralizes the charge inside thunderstorm. Associated with lightning discharge, in the early 1990, optical luminous event occurring just above the thunderstorm was firstly reported by the US scientists, and is reported to occur just after the positive lightning with large amount of charge. Though the luminous events so called sprite, elves and jets have been investigated by numerous researchers all over the world mainly from ground observation, some basic mechanism such as why the sprite has column structure, why some sprites occur several tens of km away from the parent thunderstorm is not fully understood. One of the best ways to answer these questions is to observe these events from space platform. In the JEM-GLIMS mission, we have several synchronized sensors, and not only sprite but also parent lightning are observed in order to reveal some basic mechanisms of sprite and associated lightning. These sensors consist of two optical imagers at two different frequencies, photo meters at six frequencies, and the VHF antennas to detect, locate and identify the lightning process which produces sprites.

Our goals are (1) to detect and locate lightning and sprite within storm scale resolution over a large region of the Earth's surface along the orbital track of the ISS without any bias, (2) to clarify the sources of the sprite, and (3) to identify the sources of the terrestrial gamma ray flash. In this presentation, background, mission purpose, scientific goals, instrumentation, and current status of the mission are reported.

キーワード:雷,宇宙,大気電気

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