

JEM-GLIMS Mission

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Lightning and sprite measurement sensors on the International Space Station (ISS) are introduced in this presentation. Lightning is an electrical discharge which neutralizes the charge inside thunderstorm. In the early 1990, optical luminous event occurring just above the thunderstorm was firstly reported by the US scientists and is associated with 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 simultaneously with other many sensors including camera, photometer, VHF sensor and VLF sensor. 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.