航空機による雷放電の観測
Observation of Lightning by Aircraft

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Observation of lightning from aircraft has been used to design a satellite sensor to detect and locate lightning discharge. Optical Transient Detector (OTD), and Lightning Imaging Sensor (LIS) are all designed based on the data obtained in the field campaing using ER2 aircraft NASA and these measurement provides the characteristics of peak amplitude, optical pulse duration, and pulse interval from the illuminated cloud by lightning. Based on the success of these missions, recently GLM (Geostationary Lightning Mapper) was successfully launched into the geostationary orbit and is in operational mode this year. The GLM is expected to give us time and location of lightning discharges with more than 90% detection efficiency, and the data is useful to have early warning to tornado and hazardous pheonomena cause by lightning producing thunderstorm.
On the other hand, GLIMS (Global Lightning and Sprite Measurements) mission showed that the multi frequencies observation of optical lightning from space could discriminate cloud to ground and cloud lightning by taking the ratio of amplitude between the different wavelength (Adachi et al. 2016), which is not possible with the GLM sensor.
In this presentation, a proposal on the optical observation of lightning at multiple frequencies with high temporal resolution from aircraft will be presented. Also some scientific and social background are also presented.

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