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Importance of Lightning Observations from Geostationary Orbit

SATO, Mitsuteru[1*] ; USHIO, Tomoo[2] ; ADACHI, Toru[3] ; SUZUKI, Makoto[4]

[1]Faculty of Science, Hokkaido University, [2]Graduate School of Engineering, Osaka University, [3]Meteorological Research Institute, [4]ISAS/JAXA

Lightning is a good proxy to represent the activities of the deep convections in the tropics and subtropics. Recent studies showed a close relation between lightning activities and typhoon (hurricane) intensities, upper-tropospheric water vapor variability, and temperature fluctuations in the tropical atmosphere. Moreover, a number of studies on the lightning data assimilation into mesoscale models presented considerable improvement in the accuracy of the weather forecast. As the importance of the lightning measurements are greatly acknowledged, a single-channel, near-infrared optical camera, named Geostationary Lightning Mapper (GLM), will be onboard GOES-R and GOES-S. In Europe, same type of the lightning detector, named Lightning Imager (LI), will be onboard MTG-I. After the launch of these geostationary satellites, which is planned within a few years, lightning activities over North and South America, Africa, Europe, the Atlantic Ocean, and the Indian Ocean will be continuously monitored. However, an installation of the lightning detector on the future MTSAT series is not planned so far. At the presentation, we will discuss the importance of lightning observations from geostationary orbit and their applications.

Keywords: lightning, geostationary satellite, data assimilation, severe weather, nowcasting