



ULAT Project: Lightning Observations in the Philippines for the Intensity Prediction of Severe Weather

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Lightning activity represents the thunderstorm activity related to severe weather events, such as tropical cyclone, torrential rainfall, tornado, down burst, and so on. Especially, thunderstorm activity related to tropical cyclone is an important parameter in terms of the energy inputs from the ocean to the atmosphere. Recent studies suggest that it is possible to predict the maximum wind velocity and minimum pressure of a tropical cyclone by one or two days before if the lightning activities in the tropical cyclone are monitored. Many Southeast Asian countries suffer from the attack of tropical cyclones (typhoons) and have a strong demand to predict the intensity development of typhoons. Thus, we started developing a new lightning observation system and installing the observation system at Guam, Palau, and Manila in the Philippines since September 2017. The lightning observation system consists of a VLF sensor detecting lightning-excited electromagnetic waves in the frequency range of 1-5 kHz, an automatic data-processing unit, solar panels, and batteries. The data-processing unit automatically analyzes the lightning-related pulse signals detected by the VLF sensor and transmit the text data containing only the extracted information of the trigger time and pulse amplitude to a data server via the 3G data communication line. In addition, we are now developing an upgraded lightning and weather observation system, which will be installed at 50 automated weather stations in Metro Manila and 10 radar sites in the Philippines under the 5-year project (ULAT: Understanding Lightning and Thunderstorm) scheme. At the presentation, we will show the initial results derived from the lightning observation systems in detail and will show the current status of the ULAT project.