Observation study of the relationship between lightning activity and tropical cyclone intensity in the Philippine Sea

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The accuracy of tropical cyclone track forecast has been improved year by years, on the other hand, the forecast of tropical cyclone intensity still has a difficulty of improvement. Recently the relationship between lightning activity and tropical cyclone intensity has been investigated. Lightning activity reached its maximum one or two days before the lifetime maximum intensity of tropical cyclone. Therefore, monitoring the lightning activity can lead to a short term forecast of tropical cyclone intensity. A project of Combination of Ulat (Clouds) and Kidlat (Lightning) of Science and Technology Research Partnership for Sustainable Development (ULAT/SATREPS) starts from April 2017 to develop a methodology on short term forecast of extreme weather (torrential rainfall and lightning) and typhoon intensities in Metro Manila cooperating with Researchers of Advances Science and Technology Institute (ASTI) in the Philippines. One of the major objective is to deploy the lightning observation system in the Philippines. At the first step, we installed lightning observation system in Koror Palau in September 2017. Tropical storm Lan, Kai-tak, Tembin and Samba were generated near Palau after September in 2017. When the tropical storm started developing, lightning activity drastically increased simultaneously. On the other hand, lightning activity was remained weak in cases when tropical storm did not develop. Observation campaigns of airborne observations with dropsondes are planned in summer of 2018 in the Philippines Sea to capture the atmospheric structure of thunderstorm clouds within tropical cyclones. The combination of lightning and tropical cyclone observation will develop the understanding the relationship for a short-term forecast of tropical cyclone intensity.

Keywords: tropical cyclone, lightning, Philippines