Multi-location meteorological observation system and micro-satellites for extreme weather forecast

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One of the strongest difficulties in forecasting extreme weathers, such as torrential rainfall by individual thunderstorm or typhoon, is the shortage of the observation point density and narrow coverage of the conventional radars. We have been developing an observation system for extreme weather monitoring, consisting of micro-satellites and automated weather stations with ground-based lightning sensor in the projects of a SATREPS “ULAT” and e-ASIA under international cooperation among Japan, Philippines, Indonesia and other SE-Asian countries supported by JST, JICA, PHL-Microsat and other fundings.

We distribute AWS with VLF radio wave lightning sensor at 12 sites in nation-wide of Philippines and those with electrostatic field sensors at 50 sites in Metro Manila. We also operate micro-satellites developed and controlled by our group in order to capture the 3 dimensional structure of the thunderstorms or clouds in typhoon eye by the on-demand operation of 50-kg micro-satellites, including the Philippine-developed satellites. Also few more lightning stations installed in Indonesia and Japan are used to cover broader area.

In this presentation, we discuss the strategy of the observation with these instrumentations which will be effectively used for the analysis with AI.

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