Aircraft observations of typhoons for typhoon disaster prevention: An observation of very intense typhoon LAN (2017) in the T-PARCII project

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Violent wind and heavy rainfall associated with a typhoon cause huge disaster in East Asia including Japan. For typhoon disaster preventions, accurate estimation and prediction of typhoon intensity are very important. However, intensity data of the intense category such as supertyphoon have large error after the US aircraft reconnaissance of typhoon was terminated in 1987. Intensity prediction of typhoon also has not been improved sufficiently for the last few decades. To improve these problems, in situ observations of typhoon using an aircraft are indispensable. The T-PARCII (Tropical cyclone-Pacific Asian Research Campaign for Improvement of Intensity estimations/forecasts) is aiming to improve estimations and forecasts of tropical cyclone intensity as well as storm track forecasts. The project is funded by the Japanese Grant-in-Aid for Scientific Research (Kakenhi) program for the period from 2016 to 2020. We perform aircraft observations of typhoon in the Okinawa region in collaboration with the Taiwan team. For the aircraft observation, Nagoya University and the Meisei Electric Co., Ltd. developed a new dropsonde and four-channel receiver. The first observation of T-PARCII was performed on October 21 and 22, 2017 to observe the very large and intense typhoon LAN (2017) to the southeast of Okinawa. This observation was performed as a joint observation with Taiwan DOTSTAR group which made an aircraft observation at 12 UTC October 21, 2017. We made dropsonde observations around the eyewall of LAN and in the eye from a height of 43,000 ft. Penetration observations into the eye were performed twice on 21 and once on 22 of October. The introductory presentation will briefly summarize the T-PARCII project and the result of the first observation of typhoon. The observation provides very important data for the improvements of intensity estimation and forecast as well as for studies of the typhoon.

Keywords: typhoon, aircraft observation, dropsonde, tropical cyclone, intensity forecast

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