

## The recent progress of the weather forecast system based on the NICAM-LETKF assimilation system

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A near-real time weather forecast system based on a data assimilation system of Local Ensemble Transform Kalman Filter for the Nonhydrostatic ICosahedral Atmospheric Model (NICAM-LETKF Terasaki and Miyoshi 2017, Kotsuki et al., 2017) called NEXRA (NICAM-LETKF JAXA Research Analysis) has been developed by the collaboration of JAXA, RIKEN, and the University of Tokyo. The operational system, which is operated at JAXA's super computer (JSS2), provides 5-day weather forecast every 6-hour initialized by the ensemble mean of 100 members of the NICAM-LETKF data assimilation system. The assimilated observations are GSMaP (precipitation), AMSU-A (temperature), and PREPBUFR. At current stage, the 5-day forecast data with horizontal resolution at 112 km are available on the website ([https://www.eorc.jaxa.jp/theme/NEXRA/index\\_j.htm](https://www.eorc.jaxa.jp/theme/NEXRA/index_j.htm)). We introduce two recent progress toward the next generation NEXRA in this presentation. One is the development of the 5-day forecast system with finer horizontal resolution at 28/14 km, and the other one is a new NICAM-LETKF system assimilated observation data obtained from mhs (humidity) and atms (temperature and humidity), in addition with GSMaP, AMSU-A, and PREPBUFR. The new forecast system is initialized with 28/14 km data linearly interpolated from 112 km initial states obtained from the current NICAM-LETKF system and the cloud microphysics scheme NSW6 (Tomita 2008) is used. To validate the new forecast system, we show the forecast experiment for the typhoon KROSA in August 2019 which hit SHIKOKU Island of Japan. Results show that the forecasted typhoon structure and the rain pattern of KROSA showing good agreements with observations. To validate the new system, we compare assimilation performance between the current and new NICAM-LETKF system.

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