
Status and Plans of Data Assimilation at KIAPS

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Abstract

The renewed Korea Institute of Atmospheric Prediction Systems (KIAPS) aims at developing a unified framework for seamless prediction from very short range (~6 hours) to extended medium range (~30 days), including coupling to various earth system components, such as the land surface, oceans, and sea ice. The first phase of the KIAPS project delivered the global atmosphere-only NWP system that was made operational at the Korea Meteorological Administration (KMA) in April 2020. The NWP model - named the Korean Integrated Model (KIM) - is a non-hydrostatic model based on a cubed-sphere grid, utilizing the spectral element method within the dynamics. The global data assimilation (DA) system is based on a hybrid-4D-EnVar system for the deterministic analysis, and an LETKF for ensemble perturbation updates, and is already giving good performance. Many types of observations, including conventional data, GPS-RO, AMSR2, AMSU-A, MHS, ATMS, MWHS2, IASI, CrIS, and clear sky radiances from GK-2A, are quality controlled by the KIM Package for Observation Processing (KPOP). Trials to test assimilation of ALADIN wind data and Ground GNSS observations are also due to begin shortly. As well as continuing to strengthen the existing atmospheric DA system, we are planning new developments which include convection-permitting scale DA for areas of interest, coupled atmosphere-ocean DA, machine learning techniques for observation quality control, and an extended observation processing system for newly available observations.

Keywords: Hybrid data assimilation, coupled data assimilation, seamless prediction model

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