



The KIAPS global NWP model development project at the Korea Institute of Atmospheric Prediction Systems (KIAPS.org)

Young-Joon Kim, Dong-Wook Shin, Emilia Jin, Tae-Jin Oh, Hyo-Jong Song, and In-Sun Song
Korea Institute of Atmospheric Prediction Systems, Seoul, Korea, Republic Of (yj.kim@kiaps.org)

A nine-year project to develop Korea's own global Numerical Weather Prediction (NWP) system was launched in 2011 by the Korea Meteorological Administration (KMA) with the total funding of about 100 million US dollars. For the task, the Korea Institute of Atmospheric Prediction Systems (KIAPS) was founded by KMA as an independent, non-profit organization.

The project consists of three main stages. The first stage (2011-2013) is to set up the Institute, recruit researchers, lay out plans for the research and development, and design the basic structure and explore/develop core NWP technologies. The second stage (2014-2016) aims at developing the basic modules for the dynamical core, physical parameterizations and data assimilation systems as well as the applied module for the system framework and couplers to connect the basic modules and external models, respectively, in a systematic and efficient way. The third stage (2017-2019) is for validating the prototype NWP system built in stage 2, including necessary post-processing systems, by selecting/improving modules and refining/finalizing the system for operational use at KMA.

KIAPS designed key modules for the dynamical core by adopting existing and/or developing new cores, and developed a barotropic model first and a baroclinic model later with code parallelization and optimization in mind. Various physical parameterization schemes, including those used operationally in NWP models as well as those developed by Korean scientists, are being evaluated and improved by using single-column and LES models, and explicit simulations, etc. The control variables for variational data assimilation systems, the testbeds for observational data pre-processing systems, have been designed, the linear models for a barotropic system have been constructed, and the modules for cost function minimization have been developed. The module framework, which is flexible for prognostic and diagnostic variables, is being developed, the I/O structure of the system is being designed, and the coupling modules for external systems are being constructed.

At the assembly, the general plans for and current status of the KIAPS-GM project will be presented and discussed.