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Development of the Coupled Korean Integrated Model

The Korean Integrated Model (KIM) was developed for global weather forecasting at the first Phase (2011–2019) of the Korea Institute of Atmospheric Prediction Systems (KIAPS), and it has become the operational model of the Korea Meteorological Administration (KMA) since April 2020. To improve the predictability beyond 2 weeks, it is necessary to better represent the physical process and interaction between the atmosphere and surface. Therefore, the new KIAPS Phase 2 project (2021–2026) aims to advance the land surface model and to couple the ocean/seaice/wave/river-routing models to the operational KIM.
At the first stage (2020–2022), the KIM was newly coupled to ocean (the Nucleus for European Modelling of the Ocean; NEMO) and seaice (Sea Ice modelling Integrated Initiative; SI3) models by means of Model Coupling Toolkit (MCT) coupler. The evaluation result showed that the performance of the coupled KIM is promising on medium-range forecast as well as seasonal simulations when compared to the uncoupled version. The community Noah land surface model with multi-parameterization (Noah-MP) became optional to explicitly consider the geographical processes within snow and canopy layers. In addition, the river-routing (Catchment-based Macro-scale Floodplain; CaMa-Flood) and wave (Wave Watch III; WW3) models were coupled at a preliminary stage and their sensitivity are being explored. In the conference, the status and future plan of the coupled KIM will be presented in detail.

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