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Evaluation of the East Asian monsoon using Korean Integrated Model (KIM)

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Korea Institute of Atmospheric Prediction Systems (KIAPS) started to develop a new global atmospheric model in 2011 and launched semi-real time forecast since July 2015 named the Korean Integrated Model (KIM). It is meaningful in developing its own model and there are expectations for improvement in weather forecast performance on the Korean Peninsula. In this study, we designed seasonal simulations using the latest version of KIM (version 3.3a) to evaluate the performance of the model, especially focused on simulation of the East Asian monsoon which directly affects summer and winter weather on the Korean Peninsula and to check its stability for long-term integration. The East Asia monsoon has its characteristics divided by summer and winter. Summer monsoon covers both subtropics and mid-latitudes and its rainfall tends to be concentrated in rain belts that stretch for many thousands of kilometers and affect China, Japan, Korea, and the surrounding areas. And winter monsoon makes cold and dry weather over the East Asian caused by strengthening of the high pressure in Siberian and low pressure in Aleutian. We evaluated how realistically these characteristics were simulated in the model. Five member ensemble runs for each experiment are performed with initial data at 24 h interval starting from 00 UTC 1 May 2017 for summer season and from 00 UTC 1 November 2016 for winter season. As a result, the westerly wind is stronger than analysis of IFS over the South China Sea and the Philippine Sea, and the northwest Pacific high is not sufficiently extended to the west in summer. These biases make a mismatch of pattern of precipitation. And winter season has a cold bias over the land and strengthens Siberian high, but the intensity of monsoon is maintained as the Aleutian low weakens. These results show that it is necessary to be careful in analyzing the monsoon simulation and improvement of model is needed for long-term integration.