



## Added Value of reproduced precipitation by high resolved regional climate model simulation over CORDEX-East Asia

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In the framework of the CORDEX-East Asia, evaluation simulations using high-resolution regional climate models (SNURCM and HadGEM3-RA) with ~25km (Phase2) grid scale have been conducted. In this study, we investigate whether the higher-resolution regional climate models (RCMs) can generate added values for summer mean precipitation, large-scale circulation, and extreme precipitation compared to those with lower-resolution (~50km, Phase 1). In addition, the added value index is used to quantitatively analyze the abilities of fine- and coarse-resolution RCMs. Hence, sets of phase 1 and phase 2 simulations of two RCMs are compared to observations in the East Asia region. In SNURCM simulations, positive (negative) added value of summer mean precipitation is reproduced over most ocean (land) region of East Asia in fine-resolution simulation. Extreme precipitation over Korea and Japan is well reproduced in Phase 2 simulations because the simulations of typhoons and East Asia summer monsoon are improved. In HadGEM3-RA simulations, the results of summer mean precipitation over most East Asian regions above 25°N are improved in Phase 2, while worse results are reproduced below 25°N. But, extreme precipitation in fine-resolution simulation is adequately reproduced in most regions of East Asia except China and the Yellow sea. As a result, the results of the simulations are different depending on the characteristics of the individual models, but more positive added values for the intensity and spatial distribution of precipitation over East Asia are generated as the horizontal resolution of RCMs increases.

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