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Finding the Optimum Microphysics and Convective Parameterization Schemes for the WRF Model for LPRU, Thailand

Nested model simulations were performed using the Weather Research and Forecasting (WRF) model (v. 3.6) ran in the High-Performance Computer (HPC) cluster of the National Astronomical Research Institute of Thailand (NARIT) for northern Thailand (2 km spatial resolution and hourly output), for the whole of Thailand (10 km spatial resolution and hourly output), and for the entire Southeast Asia (50 km spatial resolution and 3-hourly output). Combinations of the WRF Single-Moment 3-class, the WRF Single-Moment 5-class, the Lin et al. (Purdue), the WRF Single-Moment 6-class and the WRF Double-Moment 6-class microphysics parameterization schemes, as well as the Betts-Miller-Janjic, the Kain-Fritsch scheme, the Grell-Freitas (GF) ensemble and the Grell 3D cumulus parameterization schemes were utilized to determine the optimum microphysics and convective parameterization of the model when compared to observations at the Lampang Rajabhat University (LPRU) during the hot dry season from May 1-12, 2015. Using metrics such as the bias, mean abosolute error, root-mean-square error, correlation coefficient and the slope showed that the Lin et al. (Purdue) microphysics scheme combined with the Betts-Miller-Janjic convective parameterization was optimum for the 2 km resolution, while the WRF Single-Moment 3-class microphysics and Kain-Fritsch convective parameterization combination was optimum for the 10 km resolution.

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