Numerical simulations of a diurnal cycle of precpitation during Pre-YMC field campaign

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Diurnal cycles of precipitation over the Maritime Continent (MC) are investigated, making use of a cloud resolving models (Scale and WRF). Some numerical simulations were conducted to reproduce the diurnal cycle observed during the “Pre-YMC” field campaign in late November- December 2015. In the earlier period of the campaign, the background zonal wind was easterly, because the Madden-Julian Oscillation (MJO) stayed over the Indian Ocean, and the precipitation system migrating to the west was frequently observed. After the middle of December, the MJO passed over the MC region, and the background zonal wind turned to westerly. Following the change of the zonal wind direction, the precipitation system migrating to the east was dominant. Numerical simulations successfully captured the diurnal cycle of precipitation over the land and the migration of the precipitation systems was well reproduced during both periods in term of the direction. However, the migration speed was different among the simulations. From some sensitivity tests, it is concluded that the horizontal resolution of the model is most critical to reproduce the realistic migration speed.

