EMS Annual Meeting Abstracts Vol. 10, EMS2013-184, 2013 13th EMS / 11th ECAM © Author(s) 2013



Verification and Comparison of WRF Rainfall Simulations under Various Cumulus Parameterization Schemes on a 2011 Off-season Heavy Rainfall

S. Kirtsaeng (1) and S. Kirtsaeng (2)

(1) Meteorological Development Bureau, Thai Meterological Department, Bangkok, Thailand (sukritk@hotmail.com), (2) Department of Mathematics, Faculty of Science, Silpakorn University, Nakorn Pathom, Thailand (owon.cornell@gmail.com)

A numerical weather simulation of the abnormally severe heavy rainfall event over Southeastern Coast of Thailand on 28 March 2011, was selected for this study. Three cumulus parameterization schemes, namely, the Kain-Frisch (KF), the Grill-Devenyi (GD), and the Betts-Miller-Janjic (BMJ) schemes were applied for the Weather Research and Forecasting (WRF) model. The observed rainfalls from the Tropical Rainfall Measuring Mission (TRMM) and the Thai Meteorological Department (TMD) were utilized to verify the rainfall simulation results. The performance of these three schemes was evaluated by mean of categorical skill scores, such as, frequency bias (BIAS), critical success index (CSI), and equitable threat scores (ETS). The specific location of the intense precipitation and the magnitude of rainfall were very-well simulated in the KF and GD scheme. The categorical skill scores evaluation revealed that the 3 schemes perform equally well in predicting the rainfall of less than 70 mm/day. However, in the case of rainfall more intense than 90 mm/day the KF scheme significantly outperforms the other two schemes.

Key Words: WRF model, convective parameterization, heavy rainfall simulation, off-season heavy rainfall.