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Verification of Simulated Accumulated Precipitation

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Abstract : Precipitation forecasts are one of the most demanding applications in numerical weather prediction (NWP). Georgia, as the whole Caucasian region, is characterized by very complex topography. The country territory is prone to flash floods and mudflows, quantitative precipitation estimation (QPE) and quantitative precipitation forecast (QPF) at any leading time are very important for Georgia. In this study, advanced research weather forecasting model's skill in QPF is investigated over Georgia's territory. We have analyzed several convection parameterization and microphysical scheme combinations for different rainy episodes and heavy rainy phenomena. We estimate errors and biases in accumulated 6 h precipitation using different spatial resolution during model performance verification for 12-hour and 24-hour lead time against corresponding rain gouge observations and satellite data. Various statistical parameters have been calculated for the 8-month comparison period, and some skills of model simulation have been evaluated. Our focus is on the formation and organization of convective precipitation systems in a low-mountain region. Several problems in connection with QPF have been identified for mountain regions, which include the overestimation and underestimation of precipitation on the windward and lee side of the mountains, respectively, and a phase error in the diurnal cycle of precipitation leading to the onset of convective precipitation in model forecasts several hours too early.

Keywords : extremal dependence index, false alarm, numerical weather prediction, quantitative precipitation forecasting
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