Spatial verification of rainfall forecasts for very severe cyclonic storm 'Phailin'

SAJI MOHANDAS and HARVIR SINGH

ABSTRACT. The current study demonstrates the utilisation of a tool for the comprehensive evaluation of model forecasts using both traditional and spatial diagnostic techniques. The fundamental idea is to provide additional and meaningful insight into the model weaknesses and strengths in terms of underlying physical processes especially for very high resolution models and observations. The traditional scores also suffer from the so called "double penalty" issue and hence alone cannot provide a measure of spatial and temporal match between the forecast and observed rainfall patterns. Method for Object-based Diagnostics Evaluation is a spatial verification technique in the category of displacement methods while wavelet analysis comes into filtering type of spatial verification. Former is a features based verification technique while the latter is based on scale-separation principle. The case of Very Severe Tropical Cyclone 'Phailin' is taken up for the study and the rainfall forecasts from Global Forecast System and Unified Model run at National Centre for Medium Range Weather Forecasting are verified against gridded satellite-cum-raingauge-merged rainfall analysis. The traditional verification scores were computed using categorical and continuous measures and the spatial verification scores were computed against various thresholds. The results are presented to summarise the overall performance of both the global models with respect to the rainfall prediction.

Key words – Model evaluation tool, Categorical verification scores, Object-based diagnostics, Intensity-scale analysis.