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Assessment of an automatic, object-oriented approach to the verification of spatial fields

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The statistical technique of cluster analysis has been employed to perform object-oriented verification of high-resolution mesoscale numerical predictions. The technique was designed to provide fully automated, non-subjective verification of complex discontinuous fields such as precipitation. Initially, the method was used to identify clusters in the forecast and observed fields separately. This methodology also allowed the use of numerous criteria (location, precipitation rate, precipitation type, etc.) in identifying and matching clusters. This initial methodology proved to be computationally intensive and difficult to interpret. In this presentation, the authors describe the results of an improvement on the cluster analysis technique in which the cluster analysis is performed on the combined set of forecasts and observations rather than on the individual fields separately. The improved method is tested on a set of 128 predictions and verifying reflectivity fields for 32 days during the spring 2005 high-resolution mesoscale experiment over the eastern United States. Predictions from two high resolution versions of the Weather Research and Forecast model (WRF) and the NOAA Mesoscale Model (NMM) are verified and compared.