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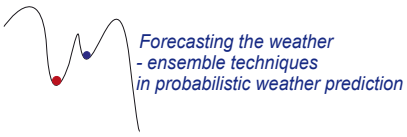

A New Analog-Based Ensemble Design for Numerical Weather Predictions

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A new ensemble design based on a set of analog forecasts is proposed (analog-ensemble). The analog of a forecast for a given location and time is defined as the observation (or analysis grid point) that verified when a past prediction matching selected features of the current forecast was issued. The analogs are generated from the operational National Centers for Environmental Prediction (NCEP) Global Forecast System (GFS) and evaluated against hundreds of surface stations and tens of radiosondes over the continental US for winds and temperature, and over a period of several months. Attributes of the analog ensemble are estimated, including reliability, resolution, sharpness, and spread-error consistency. The skill of the analog-ensemble is also compared to a state-of-the-science operational system, the Environment Canada Regional Ensemble Prediction System (REPS).