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Prediction of Extratropical Cyclones by TIGGE Ensemble Prediction Systems

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A cyclone identification and tracking methodolgy has been used to analyse the prediction of extratropical cyclones by nine different ensemble prediction systems (EPS), archived as part of the THORPEX Interactive Grand Global Ensemble (TIGGE) project. Forecast verification statistics have been produced (using the European Centre for Medium Range Weather Forecasts [ECMWF] analysis as the truth) for cyclone position, intensity and propagation speed, showing large differences between the different EPS in both hemispheres. The results show that the ECMWF ensemble mean and control forecast have the highest level of skill for all cyclone properties, with the Japanese Meteorological Administration (JMA), the National Centers for Environmental Prediction (NCEP), the Met Office (UKMO), and the Canadian Meteorological Centre (CMC) having the next highest level of skill. The results also show that NCEP, the Centro de Previsa o de Tempo e Estudos Climaticos (CPTEC), and the Australian Bureau of Meteorology (BoM) all have faster intensity error growth in the earlier part of the forecast. These EPS are also very underdispersive and significantly underpredict intensities. Cyclone propagation speed is underpredicted (i.e. the cyclones propagate too slowly) by all EPS in both hemispheres.