



Predictability of Euro-Atlantic weather regimes in medium-range forecasts: Results from the TIGGE and NOAA GEFS reforecast data

M. Matsueda and T. Palmer

University of Oxford, Atmospheric Physics, Oxford, United Kingdom (matsueda@atm.ox.ac.uk)

The predictability of Euro-Atlantic weather regimes in the medium-range timescale (up to 384hr) are investigated for winter (December-February) and summer (June-August) in the periods 2006/07-2012/13 and 1984/85-2012/13 using the TIGGE and NOAA GEFS reforecast data, respectively. The TIGGE portals quasi-operationally provide 9 medium-range ensemble forecasts routinely operated at BOM, CMA, CMC, CPTEC, ECMWF, JMA, KMA, NCEP, and UKMO. The positive and negative phases of the NAO (NAO+ and NAO-), Atlantic (ATL) ridge, and Euro-Atlantic (EA) blocking are detected as weather regimes over the Euro-Atlantic region (30°-87.5°N, 90°W-40°E) from the ERA-Interim data. It is well known that numerical models largely underestimate the occurrence frequency of blocking, particularly at longer-range timescales. It is found that the state-of-the-art NWP models generally well simulate the occurrence frequencies of each regime even in the latter half of the forecast times. Forecasts from NAO- show the slowest error growth in both seasons, whereas forecasts from ATL ridge (only winter) and EA blocking (both seasons) show faster error growth. However, forecast skills strongly depend on combinations of initial and verifying regimes. Models have the largest error when predicting the regime transitions from ATL ridge to NAO- and from EA blocking to ATL ridge in DJF and JJA, respectively.