# Hourly cycling and time-lagging: a new configuration for MOGREPS-UK

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**Abstract**

At the UK Met Office, we have developed a new convective-scale ensemble configuration, based on hourly re-centring on the high-resolution deterministic model. The new hourly configuration runs a subset of 3 members, every hour, centred on a new 4DVar analysis. The boundary conditions are provided by our global ensemble model, MOGREPS-G, and are updated every 6 hours. The new configuration aims at improving the timeliness of the operational forecasts as well as improving the spread of the ensemble by using different analyses. The resulting ensemble is then time-lagged over 6 subsets to create an 18-member ensemble at 2.2 km grid spacing.

This new configuration is trialled in our parallel suites. Compared to the current 6-hourly configuration (in which all members are updated every 6 hours), the first verification scores show promising results in the short-range for most variables, except for the temperature field, where errors seem to be more dependent on the recent analysis.

The new hourly configuration is also trialled to run to T+120 instead of the current T+54. A new assessment baseline has been tested to validate the model beyond the current T+54. This new assessment includes a comparison against our deterministic high-resolution model as well as against our global ensemble model. It is based on objective verification and subjective evaluation from the operational meteorologists.

In this presentation, we will summarize the latest results of our trials regarding this new configuration.

# References

Bowler NE, Arribas A, Mylne KR, KB Robertson, SE Beare. 2008. The MOGREPS short-range ensemble prediction system. Q.J. R. Meteorol. Soc. 134:703-722. DOI: 10.1002/qj.234

Bowler NE, KR Mylne. 2009. Ensemble transform Kalman filter perturbations for a regional ensemble prediction model. Q.J. R. Meteorol. Soc. 135: 757-766. DOI: 10.1002/qj.404

Hagelin S, Son J, Swinbank R, McCabe A, Roberts N, Tennant W. 2017. The Met-Office convective-scale ensemble, MOGREPS-UK. Q.J. R. Meteorol. Soc. 143: 2846–2861. DOI:10.1002/qj.3135

McCabe A, Swinbank R, Tennant W, Lock A. 2016: Representing model uncertainty in the Met Office convection‐permitting ensemble prediction system and its impact on fog forecasting. Q. J. R. Meteorol. Soc. 142. 2897-2910. DOI: [10.1002/qj.2876](https://doi.org/10.1002/qj.2876)

Tennant W. 2015: Improving initial condition perturbations for MOGREPS-UK. Q. J. R. Meteorol. Soc. 141: 2324–2336

Tennant W, Beare S. 2014: New schemes to perturb sea-surface temperature and soil moisture content in MOGREPS. Q. J. R. Meteorol. Soc. 140: 1150–1160. DOI:10.1002/qj.2202