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Ensemble forecasting at ECMWF

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The presentation summarises recent research aimed at refining the Ensemble Prediction System (EPS) at ECMWF. The talk will cover the representation of initial uncertainties and model uncertainties as well as the spatial resolution used in the EPS.

The operational EPS uses initial perturbations based on initial and evolved singular vectors. It is planned to replace the latter by perturbations from an ensemble of 4D-Vars in which model tendencies and the observed values are perturbed. The impact of these new initial perturbations will be examined.

Model uncertainties are presented currently by the stochastic physics scheme which perturbs the parameterised physics tendencies by multiplicative noise. A new version of the scheme with different spatio-temporal and multi-variate characteristics of the noise distribution is currently under final testing. Furthermore, an additional scheme based on the concept of kinetic energy backscatter is developed. Results describing the individual impact and the joint impact of the schemes will be presented.

Work is in progress to test a higher resolution forecast system. The horizontal resolution of the EPS will increase from 50 km to about 32 km while the resolution of the high-resolution forecast and the analysis will increase from 25 km to about 16 km. Preliminary results of the expected impact of the resolution increase on the EPS will be described.