Representation of model uncertainties at the Met Office UnifiedModel

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Most ensemble systems have been designed only taking into account the uncertainties due to the initial conditions however, it is now fully recognised that the representation of the model uncertainty is unavoidable. Here we present various stochastic schemes developed for the Met Office Unified Model (UM). The aim of these schemes is to target the structural errors of the model and to represent the statistical properties of non-resolved processes at the scales resolved by the model. Three schemes have been developed and are currently being used in the Met Office short-range ensemble prediction system: - The Random Parameters scheme, in which a set of tunable parameters from different parameterizations are randomly perturbed thorough the simulation. - The Stochastic Convective Vorticity scheme, designed to account for the model error due to the failure of models to effectively represent the PV anomalies which are generated by Mesoscale convective systems. - The Stochastic Kinetic Energy Backscatter (SKEB) scheme, designed to feedback into the model the energy excesively dissipated by the semi-lagrangian and horizontal diffusion schemes.

Preliminary results show a positive impact on the model's climatology and on the performance of the Met Office ensemble prediction system.