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Exploring a representation of model uncertainty in the IFS due to the transport scheme

Tuesday, 15 September 2020 09:00 (45 minutes)

ECMWF ensemble forecasts include stochastic perturbations, which are designed to represent model uncertainties. Their inclusion significantly increases the skill of the ensemble forecast at all forecast ranges. Currently, the stochastic perturbations used operationally in the IFS represent model uncertainties that are attributed to the parametrisations of atmospheric physics processes. Recent efforts have focussed on exploring how to introduce stochastic perturbations to skillfully represent model uncertainties that arise within the dynamical core.

Following work to improve the convergence of the IFS transport scheme, a new stochastic perturbation scheme has been developed. The “STOCHDP” scheme introduces stochastic perturbations to the calculation of the departure point (DP) in the semi-Lagrangian method, motivated by Diamantakis & Magnusson (2016, MWR), who analysed the impact that the complexity of the flow field has on the rate of convergence of the iterative DP calculation.

This talk will provide an overview of stochastic model uncertainty representation in the IFS and an outline of the design and sensitivities of the new STOCHDP scheme.

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Session Classification: Moderator: Michail Diamantakis (ECMWF)