



Model Physics Perturbation Growth Within Different Convective Regimes

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Convection-permitting ensembles have led to greater understanding of the variability of convective-scale forecasts. However, convective-scale variability is not fully understood, especially with respect to different convective regimes. Using a convective adjustment timescale allows a separation between the convective regimes of quasi-equilibrium and non-equilibrium. In this study, four summer convective cases are examined in a convection-permitting ensemble. The ensemble (6 perturbed members, 1 control member) is based on the operational United Kingdom Variable resolution configuration of the Met Office Unified Model and Gaussian perturbations are added into the boundary layer to improve the representation of turbulent fluctuations close to the model grid scale. There are differences in perturbation growth between the two regimes which is linked to changes in the wind field (and thus kinetic energy). For the relevant atmospheric scales, perturbation growth saturates earlier in non-equilibrium conditions compared to equilibrium conditions and is also more localised. Further understanding of perturbation growth within the different regimes could lead to better understanding of where model improvements can be made beyond increasing the model resolution.