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Contrasting Convective-Scale Perturbation Growth in Two Cases Over the UK

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The leading cause of flash floods in the United Kingdom is severe convection. The prediction of such convection poses a challenge to the state of the art numerical weather prediction because error doubling times are short (hours) compared to the lead times necessary for useful warnings. The predictability of convection also changes from case to case. Here we examine the predictability of two different convective events over the UK. The first is a case of widespread convection largely forced by the large scale, and the second is a series of relatively small convective cells which moved over the same small river catchment and caused a flash flood. The Unified Model of the Met Office is run with 1 km grid spacing and ensemble members are generated perturbing the potential temperature every 30 minutes as the simulation progresses. The predictability is addressed by comparison of the accumulations over the duration of the events as simulated by the different ensemble members and the different characteristics of the effects of the perturbations are determined. Preliminary results show that the intensity of the perturbation is the main factor in determining the error growth rate. Furthermore, for small perturbations, there is indication of a sensitivity of the growth rate to the time of day.