

Interactive comment on “Large impact of tiny model domain shifts for the Pentecost 2014 MCS over Germany” by Christian Barthlott and Andrew I. Barrett

Anonymous Referee #2

Received and published: 17 October 2019

Weather Climate and Dynamics #: 2019-5 Title: Large impact of tiny model domain shifts for the Pentecost 2014 MCS over Germany Author(s): Christian Barthlott and Andrew I. Barrett Review completed: 10/17/2019

This study presents the results of a simple experiment to test the sensitivity in simulating a high impact precipitation event over Germany by shifting the model domain by seemingly inconsequential amounts. While the study focuses on the impact of the domain shifts, essentially the ensemble model setup is an exercise in perturbing the initial conditions/lateral boundaries and thus the intrinsic predictability of convective storms.

The main result of the ensemble was that members that initialized convection in France

C1

and then subsequently moved over cooler, ocean air resulted in weaker convection that dissipated before being able to intensify into the observed MCS in Germany. On the other hand, members that kept the convection over land where it was able to tap into a more favorable environment produced convective systems that were reasonably well forecasted over Germany.

In general, this paper needs provide a clearer link to previous studies that have investigated the impact of perturbing the initial conditions/lateral boundaries. I am still unconvinced that shifting the domain would be a more promising avenue to “account for uncertainties in the initial and boundary conditions” than other techniques (see the work from Ryan Torn and colleagues since the mid-2000s). Additionally, I believe more analysis is needed than a cursory comparison of precipitation and environmental parameters. What preempted the deviations in convection evolution over land/sea? Plots and discussions of differences in upper-level vorticity, MSLP, and even SSTs would improve the analysis. Once these two chief concerns have been addressed, I will provide a more thorough review, including specific comments and suggestions, prior to publication.

Interactive comment on Weather Clim. Dynam. Discuss., https://doi.org/10.5194/wcd-2019-5, 2019.

C2