

## ***Interactive comment on “Sensitivity of high-temperature weather to initial soil moisture: a case study with the WRF model” by X.-M. Zeng et al.***

**Anonymous Referee #2**

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This paper evaluates the impact of changing soil moisture on short-range forecasts in a heat-wave event. The study uses 10 consecutive days and a large area to obtain robust conclusions. The study has a good systematic approach and presents the results well. The methodology looks sound. While many of the results are not surprising, there is value added in some aspects of the analysis, especially using budget studies for the surface temperature. The relative importance of surface heating, radiation, adiabatic motion, and advection were evaluated, bringing up interesting aspects related to the greenhouse effect of the changing water vapor, and the importance of the prevailing subsidence in the heat budget, with some clarity provided by separating daytime and

C3265

nighttime periods. I think this paper is quite acceptable and only have minor technical points.

Minor Points

1.p11672, line 23. I believe the National Center for Atmospheric Research is responsible for the ARW version. Please correct this.

2.p11673, line 16. "hottest late July"? Hottest in what sense. Please clarify this phrase.

3.p11676. I am a little concerned about the use of the term "convection" for the mean subsidence term. This is not really convection, but a mean adiabatic ascent term on the domain scale. Convection carries a very different meaning as a local eddy term often with diabatic effects. I would prefer this to be renamed carefully throughout the text.

4.p11683, line 23 and Figure 9a and 9b. The zero values at hour 0 are just initialization values and should not be plotted. Also "pronounced differences after one hour" should be considered as an artifact of this too, if this phrase is referring to the initial false gradient.

5.p11687, line 1. Should enhancement be reduction?

6.p11693, line 22. adiabatic should be diabatic?

7. Conclusions. It appears that this period is characterized by mean subsidence. I don't know if this region is always characterized by this, or if it is a result of the synoptic situation. Some comment on this is needed because it affects generality of the conclusions.

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