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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Mesoscale modeling study of the interactions between aerosols and PBL meteorology during a haze episode in China Jing-Jin-Ji and its near surrounding region – Part 2: Aerosols' radiative feedback effects" *by* H. Wang et al.

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Anonymous Referee #1 Received and published: 13 December 2014 This paper uses the chemical weather model GRAPES_CUACE with online aerosol radiation scheme to study the interactions between aerosols and meteorology during a haze episode in Eastern China. The authors show that synthetic impacts of aerosols' radiative feedback effects result in about a significant increase in surface PM2.5 for haze events.

The analysis is sound and the results are well presented. I only have few minor concerns. Overall, I recommend the paper for publication in ACP after the authors address following comments:

1) Page 28271, line 3: The acronym RAD at the first time in the paper should be explained. ResponseïijŽ A RAD experiment means s simulation with online aerosol-radiation interactions (please see line 3 on Page 28271)

2) Page 28272, line 6-7: Please clarify and correct "a sequence that has been widely noted and studied". ResponseïijŽ It should be"....which has been widely ..." and this has been revised in the manuscript.

3) Page 28272, line 11: Please add "in the lower troposphere" after "meteorological conditions" ResponseïijŽ It is revised in the manuscript.

4)Page 28274, line 12: Please change "Where I" to "Where i " ResponseïijŽ It is revised in the manuscript.

5) Page 28278, line 5-7: Please give some interpretation about "Points A, B, and C lie offshore of the Chinese coast, their temperature changes and those within SEA1 (Fig. 3d) being quite different from those within the LAND region. Why do the different and even opposite changes in vertical temperature profile induced from aerosols' radiative feedback effects exist between land and sea regions"? ResponseïijŽ These phrases are revised as the following in the manuscript: Points A, B, and C lie offshore of the Chinese coast and SEA1 represents the near China Sea region. The vertical temperature changing profiles induced from aerosols' radiative feedback effect over those are quite different from those over the LAND region due to the different surface albedo and the height and depth of aerosols layer.

6) Page 28280, line 24: Please change "to the west" to "in the western edge". ResponseïijŽ It is revised in the manuscript.

7) Table 1: Are DT06 and DT06 the difference in air temperature and pressure between

RAD and CTL experiments or the weighing coefficient? Please check! ResponseïijŽ DT06/DP06 is air temperature (K) /surface pressure (hPa) differences between RAD and CTL experiments in Table 1.

8) The caption of Figure 1 should be “Figure 1. The averaged MODIS (top) and modeled AOD (bottom) . . ..” ResponseïijŽ They are revised in the manuscript.

9) Figures 3a and 3b: both color scale bars are overlaid. Please correct. ResponseïijŽ Figure 3a and 3b are re-drawn.

10) The caption of Figure 7 should be corrected with “Figure 7. The PBL averaged air pressure (Pa) from the CTL experiment (top) and its difference between the RAD and CTL experiments (bottom) of 7–11 July.” . Please note the unit. ResponseïijŽ It is revised in the manuscript.

11) The quality of some figures is poor, the colors, number and words are hard to identify. Please improve the figures. ResponseïijŽ All the figures are examined and most of them are re-drawn.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 28269, 2014.