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Interactive comment on “Direct radiative effect of the Russian wildfires and their impact on air temperature and atmospheric dynamics during August 2010” by J. C. Péré et al.

Anonymous Referee #2

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General Comments: The paper “Direct radiative effect of the Russian wildfires and their impact on air temperature and atmospheric dynamics during August 2010”, by J. C. Péré et al., describes the estimation of the direct radiative forcing and local to regional impacts of aerosol emissions from one fire event that took place in Russia in August 2010. The smoke properties and impacts over a period of about one week (5–12 August 2010) were simulated and analyzed using a chemical transport model (CHIMERE) that is coupled off-line with the Weather Research and Forecasting (WRF) model, and the model simulations were evaluated using ground-based (AERONET) and satellite (POLDER and CALIOP) aerosol remote sensing data. The models and data are well

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described, the research is well documented, and the results systematically reported. However, the main concern I have with this paper is that it is not clear what its new and unique scientific value is to the larger science. Some of the highlighted impacts of the smoke radiative forcing include the reduction of the mid-day atmospheric boundary layer (ABL) and the diurnally averaged near-surface air temperatures, as well as “a large increase in the near-surface PM10 concentrations”. Nevertheless, the study was focused on just a single fire event, with simulations and analyses covering only a very short time period of about a week (5–12 August 2010), making it extremely localized in time and space. As such, the significance of the results within the larger context of the climate impacts of biomass burning smoke is not captured. Comparisons should be made with other fire events that occurred at other times in the same region or other regions, to establish whether these impacts are peculiar to this single fire event or a regular occurrence in this region and/or elsewhere. The authors do not need to conduct such other research themselves, but can find a few other representative cases in the literature and place their study in the larger context to enhance the scientific value of their results.

Specific Comments: Although the paper is well written in clear English language, there are quite a large number of grammatical and other errors sprinkled throughout, some of which are subtle, but still need to be corrected. A few examples are as follows: Page 15831, Line 16: Change “plume is” to “plume was”. Page 15831, Line 18: First mention of “SSA”, spell it out in full. Page 15836, Lines 6–7: Change: “. . . aerosol impacts on longwave radiation, such as sea salt and mineral dust, . . .” to “. . . sea-salt and mineral-dust aerosol impacts on longwave radiation . . .”. Page 15837, Line 11: Change “platform” to “constellation”. Page 15837, Line 15: Change “constituted of” to “constituted by”. Page 15837, Line 16: Change “population” to “properties”. Line 15838, Lines 11–12: Move “rather well” to the end of the sentence starting with “The model is . . .”. Line 15838, Line 12: Replace “associated to” with “associated with”. Line 15838, Line 13: Replace “into” with “within”. Throughout the paper: Change “in term of” to “in terms of”. Change “specie” to “species”. I have only listed a small

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fraction of such issues, and encourage the authors to have a native English speaker who is accustomed to technical writing read the paper carefully and find and correct all of such errors.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 15829, 2013.

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