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Interactive comment on “Modeling regional aerosol variability over California and its sensitivity to emissions and long-range transport during the 2010 CalNex and CARES campaigns” by J. D. Fast et al.

Anonymous Referee #1

Received and published: 10 June 2014

Exhaustive examination of regional aerosol variability during the 2010 CalNex and CARES campaigns using WRF-Chem.

Suggest shortening abstract by at least 33%. I would also mention the overarching goals of CalNex/CARES within the abstract.

End sections 4.1, 4.2, 4.3, 4.4, and 4.5 with summaries of how well the model simulated the respective quantities: meteorological quantities (4.1), trace gases (4.2), etc.

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How much of the high-bias in emissions is due to emission reductions between 2008 and 2010 and how much is due to a high-bias in the CARB2008 emission inventory?

Specific Comments: P7199L27: Needs a more specific web site

P7200L12: Why did Shrivastava et al. adjust primary organic aerosol emissions by a factor of two?

p7202L19: With respect to the "considerable differences" found by Knote et al., is there anything readers of this paper should know?

p7205L30: What do you mean by smaller "wind speed statistics"? Please re-write.

p7209L25: How much of models low bias for MVK+MACR is explained by these interferences?

p7224L16: impact of the marine intrusions → After reading the following paragraph it wasn't clear to me what you meant by this statement. You focus on a refinery source as opposed to a marine source.

p7240L9: Reducing anthropogenic emissions by 50% decreased isoprene and terpene concentrations by what percent?

p7241L8: You state the MOZART boundary conditions are likely too high. Any thoughts as to why?

Technical Corrections

p7189L10: evaluate the one configuration → evaluate one configuration

p7189L12: sensitivity of regional variations in aerosol → sensitivity of aerosol

p7189L18: contribute to errors (in what?)

p7189L26: some aerosol species (which?)

p7199L19: are also been included → are also included

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p7200L18: model domain that encompasses → model domain encompasses

p7200L19: grid spacing of 4 km is identical → grid space of 4 km. It is identical

p7202L9: consistent with trend → consistent with the observed decrease

p7202L10: that has decreased the → over the

p7203L14: optical properties variables from → optical properties from

p7205L10: observed, but the largest biases are for → observed with the largest biases for

p7209L24: PTR-MS as the → PTR-MS at the

P7209L25: may be expected to be larger than simulated → are likely to be biased high

p7211L2: Statistics that describing → Statistics describing

p7214L18: detection range 80 → detection range of 80

p7215L11: are higher than the observations at times → are occasionally higher than the observations at SPECIFY LOCATION(S)

p7226: likely to low → likely too low

p7232L25: contribute to a significant → contribute a significant

p7237L8: may be due missing important → may be due to missing important

Comments on Tables and Figures

Table 4: How is index of agreement defined?

Table 6: What are range gates?

Table 4 etc. The RMSE contains a contribution from the bias. Consider replacing the RMSE with the centered root mean square error (i.e., the RMSE after removing the mean)

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Figure 1a: R/v Atlantis line does not show up well

Figure 1c: Acronym key would be useful

Figure 3 caption should mention LA basin

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 7187, 2014.

ACPD

14, C3389–C3392, 2014

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C3392