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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Constraining CO_2 emissions from open biomass burning by satellite observations of co-emitted species: a method and its application to wildfires in Siberia" *by* I. B. Konovalov et al.

Anonymous Referee #2

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This paper presents a method to estimate CO2 emissions from open biomass burning using constraints on biomass burning rate obtained from satellite measurements of co-emitted CO and AOD, and applies the method to the case of Siberia wildfires. Key features of the method involve the derivation of the FRP-to-BBR conversion factors for different vegetation types, the optimization of the FRP-to-BBR conversion factors derived from CO and AOD, and the estimation of the diurnal cycles of FRP. A mesoscale chemical transport model is used to simulate CO columns and AOD which are used in combination with the observations to optimize the FRP-to-BBR. Monte Carlo exper-

iments are performed to estimate uncertainties. The method is described in detail for each step and is a nice scientific contribution. I recommend publication with very minor changes listed below. 1. Figure 1, instead of a linear scale, the authors may consider label the color bar with words such as “forest”, “grassland” and “neither”. 2. Figure 2b, the authors may consider label the horizontal axis with a few dates. The same applies to Fig. 7 and Fig. 8. 3. Why is Equation (5) chosen to model the diurnal cycle? 4. Page 3112, line 21, Nj and Nk should be Njl and Nkl for consistency with Equation (4). 5. Page 3113, line2, hal(t) should be hla(t) for consistency with Equation (5). 6. Do the simulations for Vm and Vm(r) have the same boundary conditions?

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 3099, 2014.