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Atmospheric Chemistry and Physics Discussions

Interactive comment on "How much CO was emitted by the 2010 fires around Moscow?" *by* M. Krol et al.

L. Yurganov

yurganov@umbc.edu

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A team led by Maarten Krol submitted a very useful paper and its title is adequate and timely. No question that bottom-up estimates are too low. However, is the top-down estimate of emission based on non-corrected satellite data enough accurate either?

One point is suspicious. Let's compare the Krol et al. estimate 24 Tg with "standard" (before correction) balance model estimates (Yurganov et al., 2011), see Table in Supplement.

Krol et al used the IASI OE data set, and their estimate is very close to the Yurganov et al. (2011) estimate for the original burdens. This agreement may be fortunate. Regretfully, Krol et al. has not demonstrated the effect of taking averaging kernels into

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account. I would recommend doing this in the final version of the paper.

Low sensitivity to the boundary layer makes fitting of the model to the measurements very uncertain. In the worst case, zero sensitivity, a correct estimate may be impossible at all. However, IASI appears to be a good sensor, but it is not ideal.

Reference.

Yurganov, L. N., Rakitin, V., Dzhola, A., August, T., Fokeeva, E., George, M., Gorchakov, G., Grechko, E., Hannon, S., Karpov, A., Ott, L., Semutnikova, E., Shumsky, R., and Strow, L.: Satellite- and ground-based CO total column observations over 2010 Russian fires: accuracy of top-down estimates based on thermal IR satellite data, Atmos. Chem. Phys., 11, 7925– 7942, doi:10.5194/acp-11-7925-2011, 2011.

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/12/C10116/2012/acpd-12-C10116-2012-supplement.pdf

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 28705, 2012.