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Comment

Interactive comment on “Isoprene emissions in Africa inferred from OMI observations of formaldehyde columns” by E. A. Marais et al.

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(1) Please note that the soil moisture stress parameterization presented on p. 7488 (Eq. (3)) is wrongly attributed to Müller et al. (2008); this parameterization is part of the original MEGANv2.1 model, see Equation (20) in Guenther et al. (2006).

Response (1): We have edited the reference in text on page 7488 line 10: “We use the soil moisture parameterization from Guenther et al. (2006) modified by Müller et al. (2008) and found by ...”

(2) Note also the the soil moisture stress factor was found in Müller et al. (2008) to decrease the global isoprene emissions by 20%, not 30% as stated on p. 7489.

Response (2): Corrected.

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(3) I concur with the remark by Reviewer 2 that the implementation of the epoxydiol scheme does not realistically test the possible uncertainties in the chemical mechanism (see also Stavrou et al., 2010), although I acknowledge that there is no easy way to do that. It could be instructive, however, to see HCHO cumulative yields as shown in Fig. 4 using a mechanism providing a better match with observed [OH]; for example, adding two or more OH radicals in the reaction of isoprene hydroperoxides with OH (as suggested by Lelieveld et al. [2008]) could be a cheap yet effective way of boosting [OH] in the box model simulations. This is not entirely satisfactory, since the failure of traditional mechanism to match the observed [OH] strongly suggests the existence of additional pathways, with unknown consequences regarding the yield of HCHO.

Response (3): We have tested the impact of production of 3OH molecules from OH oxidation of isoprene hydroperoxides on yields of HCHO in the DSMACC box model. HCHO yields are relatively insensitive to changes in OH at low levels of NO_x, as oxidation of ISOPOOH by OH leads to regeneration of ISOPOO, with low yields of HCHO. The photolysis of ISOPOOH, that can lead to the formation of additional HCHO, is much slower than OH oxidation of ISOPOOH. The cumulative HCHO yields at different NO_x levels are plotted (in green) in Figure 4 (included at end of this response) and discussed in text (page 7487, line 13).

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 7475, 2012.

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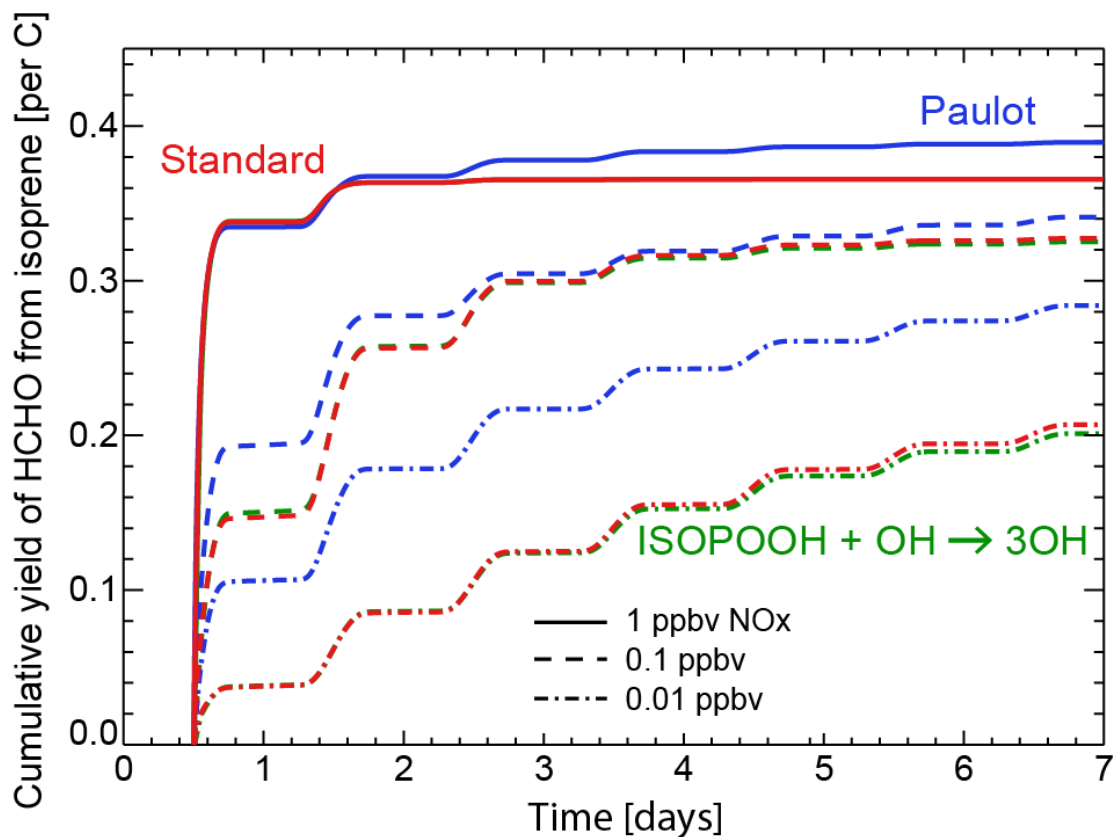
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Fig. 1. Figure 4. Cumulative yields of HCHO per unit carbon from isoprene oxidation as a function of time in the DSMACC chemistry box model using the standard GEOS-Chem chemistry scheme (red), the Paulot sche

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