

## ***Interactive comment on “Model analyses of atmospheric mercury: present air quality and effects of transpacific transport on the United States” by H. Lei et al.***

**H. Lei et al.**

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Received and published: 29 July 2013

Dear Dr. Slmer,

Thanks for your careful review, and unique comments. Your comments have effectively improved the quality of our draft and help us better understanding the emission we used in modeling. In the revised manuscript, we have incorporated all your comments. In the response below, we address each of these comments. The Reviewer's comments are italicized and our responses immediately follow.

1. The authors use the global emission inventory for 2000 by Pacyna et al. (2005)

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which contains grossly overestimated mercury emissions in South Africa (Brunke et al., 2012, and references therein). The overestimation is based on the assumption that amalgamation is the dominant technology used in gold mining in South Africa whereas, in reality, the cyanide extraction technology is used which emits hardly any mercury.

Revised: Thanks! We updated the explanation on this. We did suspect the emission problem, but did not get this reference before. This is an important contribution to this paper. I am also thinking doing a study about introducing other mercury emission inventories in CAM-Chem model and compare their effects on reproducing the global mercury concentrations.

2. In Table 2 the modeled concentrations are compared with the measurements in 1998 – 2002 at Cape Point on the basis of two references: Baker et al. (2002) and Witt et al. (2010). The data presented in Baker et al. (2002) contain measurements only until June 1999 and Witt et al. (2010) made measurements onboard ship east of Madagascar in November 2007 which fits neither the stated interval nor the site. More suitable data for comparison are listed in Table 1 of Slemr et al. (2008) with annual median mercury (Hg<sub>0</sub>) concentrations varying between 1.19 and 1.25 ng m<sup>-3</sup> for the years 1999 – 2004. Thus mercury pollution in South Africa is substantially smaller than claimed by the authors.

Revised: Revise the text to include the important information you provided. We update the observations used on Cape point.

Thanks! Hang Lei

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 9849, 2013.