

Interactive comment on “Origin and radiative forcing of black carbon transported to the Himalayas and Tibetan Plateau” by M. Kopacz et al.

S. Bauer (Referee)

sb2273@columbia.edu

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The paper presents a modeling study on the origin and forcing of black carbon in the Himalaya region using the GEOS-CHEM model and its adjoint modeling tool. The paper compares simulated and observed BC concentrations in the Himalaya region, estimates regional BC and snow albedo forcings and uses the adjoint model to track the origin of BC at different stations. The papers main findings are that emissions from India and China are the main source regions of BC to the Himalayas.

I want to congratulate the authors to this very interesting well presented paper, and I have only some minor improvements that I would like to suggest:

C9187

P 21618, L12: Hansen et al, 2005 is cited as most recent snow-albedo estimate. There are more recent papers on this, either change the word 'most recent' or include later studies.

P21618 L: 17: BC forcing is directly compared to CO₂ forcing. Comparing a short term forcing such as BC to a long term greenhouse gas forcing could be misleading. Please rewrite this sentence.

P21618 L 25: Could you summarize the findings of the cited papers, Menon et al 2010, Ramanathan and Carmichael, 2008, and Ming et al.

P21622 L 6: You assume doubled absorption in order to account for internal mixing of BC aerosol, but later in the paper (P 21627 L3) you also double the forcing numbers of your calculations. First of all I think doubling of the absorption is a bit to high, a factor of 1.5 seems more appropriate, but if you already altered absorption in your radiative calculations you should not double your forcing numbers after that. L8: Can you please explain in more detail how the snow-albedo calculation is done?

P21624 and Fig1: Maybe Fig. 1 would be more insightful if you would zoom more into the region and plot the model grid over the graph.

P21629 whole paragraph: Maybe this is just personal preference, but why do you suddenly use the phrase 'Third pole'. You still discuss the same region as before, why not stick to the same terminology.

P21635 L1: Was biomass burning especially strong during that year in Africa? Discussion: Following your study could you write a section in your discussion about the quality of emission data in China and India.

Figures: I have problems to see the arrows in Fig3. maybe it's just the printer version, but the arrows are tiny.