

Interactive comment on “Sensitivity studies on the impacts of Tibetan Plateau snowpack pollution on the Asian hydrological cycle and monsoon climate” by Y. Qian et al.

Anonymous Referee #3

Received and published: 22 November 2010

General The climate effect of black carbon (BC) deposition on snow has been highlighted since the release of IPCC AR4 (2007), and dust deposition issue is also being hot due to its absorbing nature in snow. The melting of the glaciers on the Tibetan Plateau (TP) is concerned by societies for it is a very important water supply for billions of people. Depositions of BC and dust were blamed for being responsible for part of their melting. This work primarily used modeling methods to interpret the impacts of BC and dust on the snow and ice melting on the TP and then the variation of general circulations for monsoons. And it is a first comprehensive report on influence of BC and dust. From this point of view, it should be published at last.

C10083

However, I have some specific comments that should be addressed 1) Line 5 in P. 22856. The statement “the TP glaciers have ... in the world”, is not true. Some of the glaciers on the TP are advancing. This sentence could be change to “the TP is one of the regions that glacier are suffering the fastest melting”. 2) Line 24 in P. 22857. A reference literature should be after “... by weight (ppmw) of soot”. 3) Line 21 in P. 22859. I doubt the reference “Qin et al., 2006” stated that, as I have pointed out in 1). Please change another reference. 4) Line 5-7 in P. 22860. The statement is not correct. Both of Ming et al. and Xu et al. meant the increase of BC concentrations in the ice cores were on the northern slope of Himalayas. And I could not find Xu et al. 2009 in the reference list. Please check that throughout the paper. 5) Line 13 in P. 22863. Should add a reference (Ming et al., 2009) after “Figure 3 ... in snow”. Also in the caption of Figure 3. 6) Line 9 in P. 22864. Ming et al., 2008 should be changed to Ming et al., 2008 and 2009. And Ming et al., 2008 is BC in the ice core, and Ming et al., 2009 refers to BC in the snow (Ming, J., C. Xiao, H. Cachier, D. Qin, X. Qin, Z. Li, and J. Pu (2009), Black Carbon (BC) in the snow of glaciers in west China and its potential effects on albedos, *Atmospheric Research*, 92(1), 114-123). 7) Line 26-28 in P. 22885. I did not find the authors cited Xu et al., 2006. 8) Fig. 3 in P. 22890. Has been pointed out in 5). 9) Fig. 4 in P. 22891. The plot just showed the result in the Northern Hemisphere. So just the upper half of the figure is enough. 10) Fig. 8 in P. 22895. The legend name of the experiment should be in consistent with Table 1 using capital letters. The same issue also existed in Fig. 16 and the text.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 22855, 2010.

C10084