

Interactive comment on “Deposition of brown carbon onto snow: changes of snow optical and radiative properties” by Nicholas D. Beres et al.

Anonymous Referee #1

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This work had a good try to detect the influence of brown carbon as a new variable artificially introduced into snow. The method was delicately designed and achieved expected results. The manuscript is well organized and is promising to be accepted at last. However, I have a big concern in the instrument analysis part.

Major The authors admitted that BC is a light-absorbing particle in snow, while how can their instrument manage only to measure TOC but avoid BC? If BC was mixingly measured, the total organic carbon could be overestimated. Section 2.2 does not introduce the instrument in detail and needs to strengthen the method's introduction, including the principle, accuracy and precision of the Sievers 900 measuring TOC.

Minor 1. Page 6 Line 19. ...(TOC) concentration and absorbance in the UV and visible wavelength ranges, respectively, at the Desert Research Institute (DRI)... 2. Page 6

Line 22. The organic carbon is very illusive to capture. In our previous work focusing on BC in ice, we completely excluded OC just for the same reason (Refer to 2.3 of Ming et al, 2008). Could you please present an estimation of the uncertainty, regarding the way of melting at room temperature? By the way, do you consider the newly generated bacteria inside the sample, which could, in turn, contribute some possible OC?

Ming, J., Cachier, H., Xiao, C., Qin, D., Kang, S., Hou, S., and Xu, J.: Black carbon record based on a shallow Himalayan ice core and its climatic implications, *Atmos Chem Phys*, 8, 1343-1352, 2008.

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