

## ***Interactive comment on “Impact of dust deposition on the albedo of Vatnajökull ice cap, Iceland” by Monika Dragosics et al.***

**C. He**

cenlinhe@atmos.ucla.edu

Received and published: 31 October 2016

The authors conducted both field observations and model simulations to investigate the impact of dust deposition on the albedo of Vatnajökull's ice cap. The results are very interesting and advance our understanding of dust-snow albedo effect. I have a short comment on the discussion part.

The authors did not provide enough discussions on some important factors that could influence the dust impact on reducing snow albedo. For example, previous studies found that the impact of BC/dust deposition on snow albedo reduction is significantly affected by how particles mix with snow grains and different snow grain shapes (Liou et al., 2014; He et al., 2014) as well as snow aging processes (Flanner et al., 2007). I suggest adding some discussions on this aspect.

C1

### References:

Liou, K. N., Takano, Y., He, C., Yang, P., Leung, L. R., Gu, Y., and Lee, W. L.: Stochastic parameterization for light absorption by internally mixed BC/dust in snow grains for application to climate models, *J. Geophys. Res.-Atmos.*, 119, 7616-7632, doi:10.1002/2014jd021665, 2014.

He, C., Li, Q. B., Liou, K. N., Takano, Y., Gu, Y., Qi, L., Mao, Y. H., and Leung, L. R.: Black carbon radiative forcing over the Tibetan Plateau, *Geophys. Res. Lett.*, 41, 7806-7813, doi:10.1002/2014gl062191, 2014.

Flanner, M. G., Zender, C. S., Randerson, J. T., & Rasch, P. J.: Present day climate forcing and response from black carbon in snow. *J. Geophys. Res.-Atmos.*, 112(D11), 2007.

---

Interactive comment on The Cryosphere Discuss., doi:10.5194/tc-2016-205, 2016.

C2