

Interactive comment on “Effects of snow grain shape on climate simulations: Sensitivity tests with the Norwegian Earth System Model” by Petri Räisänen et al.

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We thank Dr. Cenlin He for informing us about his very relevant recent article.

Comment: *The authors conducted a series of sensitivity simulations using the Norwegian Earth System Model to quantify the effects of snow grain shape, which could improve the understanding on the role of snow grain shape in climate modeling. For the authors' information, a very recent study (He et al., 2017) did a detailed analysis and parameterization to account for snow grain shape effects on optical properties of both clean and dirty snow, which could be cited and discussed to improve the*

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discussions in the manuscript.

Reference: He, C., Y. Takano, K. Liou, P. Yang, Q. Li, and F. Chen, 2017: Impact of C1 Snow Grain Shape and Black Carbon-Snow Internal Mixing on Snow Optical Properties: Parameterizations for Climate Models. J. Climate, 0, https://doi.org/10.1175/JCLI-D-17-0300.1

Response and change in the manuscript: We will add two sentences about this work to the Introduction section of our paper: “Very recently, He et al. (2017b) developed another parameterization for the co-albedo and asymmetry parameter of snow for potential use in snow, land surface and climate models, based on single-scattering calculations for spheres and three non-spherical shapes. This parameterization can be used for clean as well as dirty snow, as it includes the effects on co-albedo due to black carbon internally mixed with snow.” Additionally, it will be noted in Sect. 7.3 that for one of the shapes considered by He et al. (2017b), the value of asymmetry parameter appears to fit pretty well with the values derived by Ottaviani et al. (2015): “These values are, in fact, closer to the g of large spherical snow grains ($g \approx 0.89$) or that of spheroids with an aspect ratio of 0.5 ($g \approx 0.86$; Fig. 4 in He et al., 2017b) than that of the OHC.”

Interactive comment on The Cryosphere Discuss., https://doi.org/10.5194/tc-2017-118, 2017.

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