RESPONSE TO REFEREES' C258 COMMENTS
TO MANUSCRIPT TC-2015-18

Title: Tomography-based monitoring of isothermal snow metamorphism under advective conditions

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We thank the anonymous referee #1 for the constructive comments. All page and line numbers correspond to those of the Discussion Paper.

REVIEWER: Anonymous Referee #1

The paper presents the results of experiments on isothermal metamorphism of snow with presence of saturated water vapor flux in the pore space of snow. The result is simple and interesting: such air flow does not affect the isothermal metamorphism. The methods, observations and results are clearly described. The previous paper of the authors in Geophysical Instrumentations provide more details of the experimental set-up, which saves space in this paper. I am not sure how high can be the impact of the obtained results, because it is difficult to expect some flow in the pore space of snow without presence of some special temperature variability, however, as a boundary condition for modeling the process, the results sounds important.

Response: Flow in the pore space of snow occurs especially under high wind speed above the snow surface but rapidly decreases. Numerical simulations (Neumann, 2003; Colbeck et al., 1997) estimated airflow velocities inside surface snow layer (pore size ≈ 1 mm) of ≈ 0.01 m s^{-1} under high wind speed (≈ 10 m s^{-1}), neglecting an temperature gradient.

Revision: Text added in the revised manuscript:

> On page 1023, line 9: "A rapid decrease of the airflow velocity inside a snow layer (≤ 0.01 m s^{-1}) for high wind speed (≈ 10 m s^{-1}) above the snow surface (pore size ≈ 1 mm) are numerically estimated by Neumann (2003). In addition, Colbeck et al. (1997) confirmed the rapid decrease of airflow velocities inside a snow pack."

Text added in "References"

> Colbeck, S. C.: Model of wind pumping for layered snow, Journal of Glaciology, 43, 60–65, 1997.

Neumann, T. A.: Effects of firn ventilation on geochemistry of polar snow, (PhD thesis, University of Washington), 2003.

Minor revisions were made throughout the revised manuscript.

We thank the the anonymous referee for his scrutiny and recommendations.

The authors