

Atmos. Chem. Phys. Discuss., referee comment RC2 https://doi.org/10.5194/acp-2021-478-RC2, 2021 © Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.

## Comment on acp-2021-478

Anonymous Referee #2

Referee comment on "The foehn effect during easterly flow over Svalbard" by Anna A. Shestakova et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-478-RC2, 2021

The paper investigates a particular epsisode of easterly winds passing over and around Svalbard end of May 2017. Observations from various instruments and platforms (airborne, shipborne, and ground-based sensors as well as radiosondes) are combined to document the mesoscale processes in the vicinity of Svalbard during the easterly airflow episode.

Although the paper is generally well written, easy to understand and follow, the presentation of the material seems rather lengthy and redundant in some parts. There is a long introduction that focuses on climate impacts and Arctic amplification. Well, that's the framework, but the paper doesn't make a conclusive contribution to the issue. And then there is the leeward warming, which is looked at in too much detail for my understanding, since it is a known phenomenon. A novel aspect would be for the authors to present a Lagrangian analysis of the temperature and moisture evolution of air parcels starting upstream. This approach could really help to distinguish between the large-scale warming and the mesoscale effect due to the flow past the mountains. Indeed, the mesoscale numerical simulations are available and could easily be used to conduct such an analysis.

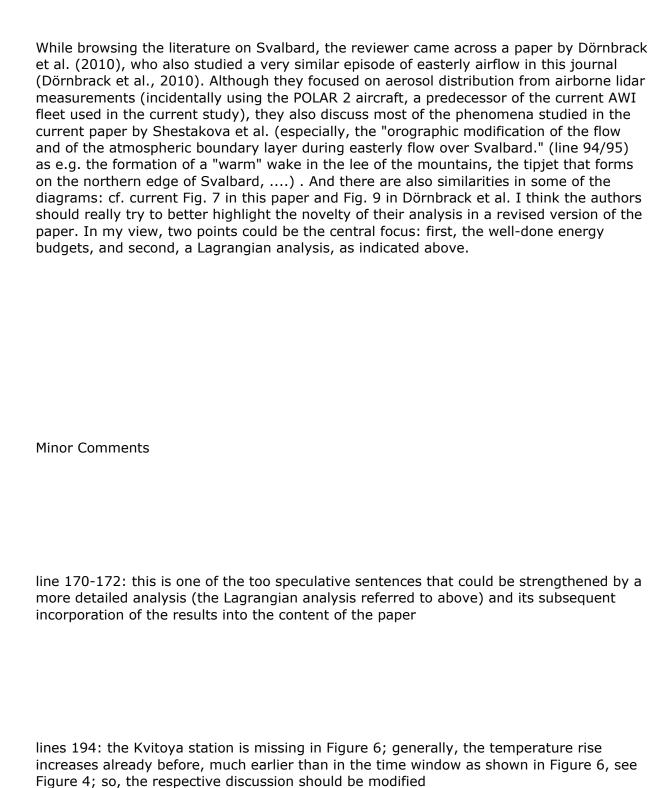


Figure 7: the labels on the left axes are misleading, since there is obviously no reference to the lines in the image

