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Interactive comment on "Blowing snow at D17, Adélie Land, Antarctica: atmospheric moisture issues" *by* H. Barral et al.

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Review of Blowing snow at D17, Adélie Land, Antarctica: atmospheric moisture issues

Introduction

Barral et al. describe a valuable dataset of blowing snow and meteorological observations performed at a site in coastal Adélie Land, Antarctica. They focus on the impact of blowing snow on the near-surface moisture. Climate models and atmospheric reanalyses – which generally do not consider blowing snow, are not able to capture these impacts.

The authors have done a great effort to combine a lot of data, both from observations

and models. The results are significant, the subject fits the scope of TC, and figures are of good quality. Although the scientific quality of their effort is very good (I don't have any major issues concerning the science), I think that the paper needs to be thoroughly revised in terms of its structure. The text continuously jumps from one subject to the other, and from methods to results, which does not enhance its readability. I cannot accept the manuscript in its present form, but I think that, when improving the structure of the text, it can be suitable for publication in TC. Below I have listed many suggestions for improvement, which hopefully aid the authors in restructuring the story.

Specific comments

P2760

title: I suggest to change the title, this is too specific and 'issues' is a vague term. What about 'Blowing snow in coastal Adélie Land and its impact on atmospheric moisture'?

abstract: this is characteristic for the remainder of the text. Try to structure the abstract, such that one sentence follows from the other. This version is extremely chaotic.

L3: East Antarctica

L10: define 'subsaturation'

L14: up to a point

L14: becomes an issue

L16: winds

L22: what is 'frequent' and 'persistent'? specify

L25: give a reference

P2761

L1: models? Specify and quantify the impact

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L5-10: on L1 you mention a result of models, and here you write that models are needed. Restructure: first this, than the results.

L18: poor weather

P2762

L4: through decreasing its buoyancy

L5: the air is even more enhanced

L10: calculated

L11: Wyoming? This needs a introductory sentence. Why look talk about Wyoming if your study is on Antarctica?

L16: this is partially compensated... How do you know? Quantify and/or give a reference.

P2763

L3-4: this is too much detail, especially for an introduction

L18: seldom = rare

L18: remarkable persistence of strong winds

L20: They proved to be

P2764

L2: interrogated = sampled

L4: run = were set up

L19: access was possible

L21-L22: this is important information, but at this point it is unclear how you will overcome this problem. This is described further in the text, which leaves this sentence a

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little lonely. I suggest combining both pieces of text.

P2766

L5-8: here you refer to the introduction and to section 3 at the same time, whereas you should focus on section 2, i.e. the methods. This is typical for many parts of the text.

L10: specify the resolution of both

L13: than grid points located inland

L24: this is unclear. First you discuss the importance of having high resolution, and it appears that you still use precipitation from ERA-Interim (which is probably the variable most sensitive to resolution). Explain.

General remark: please give a reference when using ECMWF data.

L28: in various studies

P2767

L2: a horizontally one-dimensional, vertically multi-layered physical model

L3: calculates the surface snow height at hourly time steps

L5: disposal = balance

L20-21: this is a result, not a method

P2768

L7: why not make a 'Results' section, with all current sections 3-5 as subsections?

L13: values (below 30

L14: values

L24: remove 'or null'

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L26: homogeneous = constant

P2769

L1-4: remove, unnecessary

L5-20: once more, this distracts the reader. These are not results, but a comparison of your results with existing literature.

P2770

L6: for two climate models

L4-18: again, this is not a result. It would fit to the methods and/or the figure caption.

L23: too dry

L27: AMRC AWSs ? give a reference/link

P2771

L2: located on the Ross ice shelf

P2772

this entire page can be deleted or moved to the methods (in short form) or appendix. This distracts the reader from the main story.

P2773

until L14: same for this part

L4: lost to the surface

L25: not difficult in a 10 year time series

P2774

L18: four simulations

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L20: I don't see a small impact. Sublimation changes with a factor of two!

L22: unexpectedly

L25 – P2775 – P 2776 (L6): can be omitted entirely. The MO-theory is known and does not have to be explained. Model details should be moved to the methods.

P2776

L18: FlowCapt threshold. . . can be moved to methods/figure caption

P2779

L10: I agree with this statement in terms of RH, but not in terms of temperature. I would advise to give the statistical significance of the linear trend, since I am quite sure it is not significant for temperature. In that case, I suggest removing it.

FIGURES

General comment: put the units of the displayed variable between brackets to enhance readability

Figure 10: dispersion = variability

Interactive comment on The Cryosphere Discuss., 8, 2759, 2014.