

## ***Interactive comment on “Synoptic conditions and atmospheric moisture pathways associated to virga and precipitation over coastal Adélie Land in Antarctica” by Nicolas Jullien et al.***

### **Anonymous Referee #1**

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The manuscript “Synoptic conditions and atmospheric moisture pathways associated to virga and precipitation over coastal Adélie Land in Antarctica” is a well-motivated study, which clearly presents different synoptic situations leading to virga or precipitation at Dumont d’Urville station (DDU). The paper is scientifically interesting, and provides very useful knowledge of those processes and related atmospheric conditions. The text is nicely written, and mostly easy to follow, although containing quite a lot of detailed information which makes the “main” story more challenging to follow. Anyway, this a paper that deserves to be published, after some minor revision.

General comments:

C1

- I wonder do to pressure systems/fronts affect the strength of katabatic winds at DDU, or are they more or less constant. If the katabatic winds are affected, this might affect occurrence of virga. . . This could be discussed.

Specific comments:

- Consider moving the content presented in the appendix to Supplementary material, as this information is not fundamental for the main manuscript.

- Page 7, line: instead of “weaker”, I recommend to use “lower”.

- Page 9, line 2: To me it seems that they are below 900 hPa ~20 h before, and not 8 h before (if time 0 is the arrival time at DDU, and not 48 h).

- Figure 2: Time of this cross section should be given in the caption. In addition, mark the DDU on the plot (instead of giving the latitude in the caption).

- Figure 2: Instead of “randomly” multiplying the vertical wind component by 100, one could also scale it according to the geometry of the axes. Scaling factor of the horizontal wind vectors would be wind speed/distance of the whole x-axis in km (= 20 latitude degrees in km). Similarly, y-axis scaling factor would be vertical wind/altitude distance shown on the figure (=8 km). If you use these scaling factors to plot your results, they would show the vertical movement more realistically with respect to your potential temperature etc. fields.

- Figure 3: This figure (especially in e, f, and g) contains a lot of information, almost too much. Especially, colors of trajectories (in e, f, g) are not visible enough. In addition, add date on the x-axis of (d) together with the time.

- Figure 6 has varying scale for y-axis due to different composite sizes. It would be clearer to divide the occurrence with the composite size and plot the fraction/percentage of occurrence. This would make the scale to be the same for all the variables and allow for direct comparison of the cases.

C2

