

Interactive
Comment

Interactive comment on “Observations of the atmosphere and surface state over Terra Nova Bay, Antarctica using unmanned aircraft systems” by J. J. Cassano et al.

J. J. Cassano et al.

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We thank the anonymous reviewer for their comments on our manuscript.

Reviewer: This manuscript describes observations of the atmosphere and surface state over Terra Nova Bay, Antarctica, using Aerosonde unmanned aircraft systems, in September 2012. I see this as a technical report, not necessarily as a scientific paper. The dataset described in the paper is easily accessible via the given identifier, both in netCDF and ASCII formats.

Response: We agree that this manuscript is primarily technical in nature and provides

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background information on the data collected during our September 2012 UAS campaign in Terra Nova Bay, Antarctica. As indicated by the reviewer, this manuscript also provides information on how this dataset can be accessed.

Reviewer: Some specific comments/questions: At first, in the manuscript there are lot of papers cited (mostly in the Introduction) but not given in References list?

Response: We apologize for this oversight. We will include all of the cited papers in the reference list of the revised manuscript

Reviewer: The UAS wind finding algorithm – is that standard procedure (any reference?) or just developed for data analyzes from this campaign?

Response: No reference is available for the wind finding algorithm used for this campaign. This algorithm was developed for use with the Aerosonde UAS.

Reviewer: What about cloud data – flying in clouds might be very hazardous due to potential risk of formation of ice on the UAS prop blades, wings and sensors. Was that issue considered somehow when strategies of flight missions were determined? Any real- time monitoring of telemetered T and Rh data during UAS flights?

Response: Icing was a major concern during all flight operations and we addressed this both in the forecasting phase of each mission, by evaluating high-resolution forecasts for the Antarctic Mesoscale Prediction System (Powers et al. 2012) and in real-time during each flight. Based on the AMPS forecasts of relative humidity we would identify potential flight routes and altitudes to and from Terra Nova Bay that avoided high relative humidity. During the flights humidity data was telemetered in real time and allowed us to alter the flight path or altitude to avoid high relative humidity values. Unfortunately, we did lose one aircraft as a result of icing despite these precautions.

Powers, J.G., Manning, K.W., Bromwich, D.H., Cassano, J.J., and Cayette, A.M., 2012: A decade of Antarctic science support through AMPS. Bull. Amer. Meteor. Soc., 93, 1699-1712, 2012.

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Reviewer: In Figure 3 there are maps of Terra Nova Bay flights with color shading indicating the flight attitude. It is unclear for me, is the color shading depicting only horizontal transects? For example, panel (d), AV215 flight at 18 September consists also (according Table 3) 8 vertical profiles up to 1600 m.a.g.l., but the location on the figure of those ascent/descent profiles is very hard to find if at all?

Response: The plots in Figure 3 show all elevations during the flight, but only the final elevation at a given location is evident on the figure. For the ascent / descent profiles listed in Table 3 this means that only the final elevation for the profile is shown on the figure. Since most profiles consisted of an ascent to ~ 1600 m and then a descent back to the primary flight level only the elevation of the primary flight level is obvious on these plots. Because the profile locations are difficult to identify in these figures we do list the general location of the profiles in Table 3.

Reviewer: Caption of Figure 6 should say what temperature is plotted. Also the color shading (from -10 to -40 oC) is not the most successful in order to see any changes in the temperature.

Response: The temperature data plotted in Figure 6 is the air temperature at flight level. The caption for this figure will be revised to state this.

Interactive comment on Earth Syst. Sci. Data Discuss., 8, 995, 2015.

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