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**Climate of the Past Discussions**

# *Interactive comment on* "Early ship-based upper-air data and comparison with the Twentieth Century Reanalysis" *by* S. Brönnimann et al.

**S. Brönnimann et al.**

stefan.broennimann@giub.unibe.ch

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"However their suggested correction makes the temperatures of these ascents near the surface much (3K) too warm compared to the 20CR and the rest of the profiles. Apparently not all issues are resolved there." Our correction is a guess that is consistent with our information that we have, but maybe not all isues are resolved. It should be mentioned here that the 1000 hPa level during ascents #50-61 was below sea level; the values given in the data sheets were hence extrapolated (in fact, they are not shown in any other figure of our paper). But they should be considered because they most likely stem from the same data reduction procedure (and hence should be consistent with the rest of the profiles). We make this clear in the text of the paper and in the figure caption. Also, we add a sentence that there may be remaining problems.



Minor comments: "p2427: line 11: which procedure is meant here? measurement procedures" Yes, this sentence is changed.

"line 12: Conversion of mm to SI units should be given already there instead at p 2428 line 21" Changed.

"p2432: Estimation of the observation errors of MS Schwabenland is based on several speculations. First it is not entirely clear that the radiosonde type on the ship is the same as the radiosonde type used for comparison with mountain station data. Second the estimate of the observation error is highly dependent on the estimate of the representation error. The representation error is simply estimated from the difference series between stations Jungfraujoch and Säntis. It is estimated almost as high (1.96K compared to 2.0-2.4K for the residuals). The representation error is probably less since the altitude difference between stations Säntis and Jungfraujoch (1000m) is larger than the altitude difference between stations and the respective pressure levels. Thus the observation error, which is estimated as a residual, could easily be larger than 1.2 K." It is true that the error of representativity might be smaller (and hence the observation error larger) than in our estimation. But we do not have the means to assess this quantatively. Moreover, the error of representativity varies in time and space. We added a sentence that our representation error is an estimation only and that the derived error of the observations depends critically on it.

"Fig. 2: This figure is nice to look at but does not add value to the paper. It could be omitted." We omitted the figure.

"Figs 3 and 7: the right panels would be better comparable with the right panels if observations-20CR were plotted instead of 20CR-obs." We consider the observations as a reference here, so plotting 20CR-obs is the more logical way, in our opinion.

"Fig. 4: It would be interesting to have the observed GPH plotted in the lower panel." We do not have numeric values of the pressure observations (although pressure was measured). All we have is temperature as a function of altitude.

Interactive comment on Clim. Past Discuss., 6, 2423, 2010.