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Interactive comment on “HAMP – the microwave package on the High Altitude and LOng range research aircraft HALO” by M. Mech et al.

Anonymous Referee #3

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The manuscript by Mech et al. describes HAMP, the microwave instrumentation package for the German HALO aircraft. HAMP’s capabilities to retrieve temperature, humidity, and cloud parameters are demonstrated with synthetic measurements derived from radiative transfer calculations. The performance is compared to established satellite measurements. At the end, the manuscript provides a glimpse at the first demo flights that were taken in July 2013.

The description of the HAMP system is exhaustive. Unfortunately, the description of the system’s calibration concept is somewhat short. It is not clear to me how the calibration can be achieved with only one ambient-temperature load. An example plot showing the calibration points would be helpful. Alternatively, the Allen-variance – which was certainly measured at some point – could be shown. It is also not clear how exactly the

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LN2 calibration before take-off is conducted.

One of the major error sources is the unknown surface emission. Strangely, it looks like this was not taken into account in the simulated measurements. I am missing simulations with varying surface emissions – and otherwise identical atmospheric conditions – that would show how large this influence would be.

It is also unfortunate that the first measured data from the demo flights is only shown as a side-note without much further analysis. Given that more than 150 hours of data should be available, there could have been more. The claim that "during thirteen hours of test flights, measurements have been performed which demonstrate that the instruments performed stably, and with the expected performance characteristics" is not backed up by data.

All in all, the manuscript is unbalanced in the way that it contains a lot of descriptions but not so many results. This could easily be improved by adding a few more figures, e.g. the ones that are "not shown here".

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 4623, 2014.

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