

## ***Interactive comment on “A unified data set of airborne cloud remote sensing using the HALO Microwave Package (HAMP)” by Heike Konow et al.***

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The authors are to be commended for making this field campaign data set available together with extensive quality control and calibration data. Getting everything to work in a field campaign is always a combination of hard work and luck. Things happen and those involved must respond and be innovative to address calibration, navigation, and a myriad of logistical concerns. This article describes in detail, yet concisely, how all these concerns and challenges are this is done for the HAMP instruments. Significance The combination of passive microwave/millimeter wave instruments together with a cloud radar at 35 GHz combined with dropsonde data are powerful and unique

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data sets. Passive microwave/millimeter wave instruments similar to HAMP have flown on both research and operational satellites now for almost 2 decades. A major challenge for the climate modeling and numerical weather prediction communities remains the parameterization of cloud processes and, particularly for NWP, the assimilation of cloudy radiances. This data set is useful for both communities due to the combination of active, passive, and in situ sounding data. The data set contains all elements needed by external users. Data are in the listed DOI repository and NetCDF format and names/units are used. The data repository contains essentially an NCDUMP of the file headers which helps users ensure they know the file format in advance. The data are binned into common steps so that external users do not have to collocate the different data. Overflights by the NASA A-train, which include similar instruments, are identified. There is an opportunity to further enhance the utility of the data for the NWP community. Although publishing this data set is important, I would urge the authors to consider additional outreach. For NWP, they might contact the NWP satellite applications facility (<https://www.nwpsaf.eu/site/>) advertising this data set for 1-dimensional radiance assimilation testing with their microwave imaging processing package (<https://www.nwpsaf.eu/site/software/mwipp/>). For additional outreach to the climate community, the authors may try contacting the Copernicus Climate Change Service hosted by ECMWF (<https://climate.copernicus.eu/>) and the CMIP group in the USA at PCMDI (<https://pcmdi.llnl.gov/index.html>) as well as the Earth System Grid Federation <https://esgf.llnl.gov/> ). ( I know that co-author Stevens has been active in this area as has Prof. Bony who appears to be a lead organizer of the Field campaign. Data Quality Since I am semi-retired, I do not have access to the full suite of tools the review criteria call for to assess completely the identified criteria. That said, a quick look at the data shows the fields to be within reasonable quality limits and the extensive discussion suggests the data are of high quality. It would be helpful for the authors to identify a potential physical mechanism for the application of the global bias identified in section 5.1 between the forward radiative transfer  $T_b$  computed from the profile data and the microwave measurements. Perhaps this is still under study. Microwave ob-

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servations are sometimes subject to side lobe contamination biases that can be very difficult to identify and correct. Perhaps some others can comment on exercising the data. Presentation quality The manuscript has a nice balance of description required to use the data without going too long. Figure 1 and Table 1 are particularly helpful since they quickly help potential users identify different weather/climate regimes. The references of Bony et al. and Stevens et al. provide the more complete context for the field campaigns and scientific questions being studied. The 'find data' button on the doi landing page does take the user to the WDC Climate page for each NetCDF data set for each of the four campaigns. That page does contain an NCDUMP of the file header information that is helpful. Although there are no other quick look tools provided, I know from my experience that NetCDF tools are extensive and widely supported, so this is not a major issue.

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