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Interactive comment on “The Atmospheric Radiation Measurement (ARM) program network of microwave radiometers: instrumentation, data, and retrievals” by M. P. Cadeddu et al.

Anonymous Referee #3

Received and published: 17 July 2013

General comments:

The manuscript gives an overview over the operation of passive ground-based microwave radiometers in the ARM program. After a brief introduction, the paper presents the instrumentation, different retrieval methods for atmospheric parameters, as well as calibration issues and instrument intercomparisons. The manuscript is well structured, and concisely written. Only a few specific comments and technical corrections will be listed below:

Specific comments:

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p.3725, l.12: You could state for which parameters new retrievals were developed.

p.3728, l.15: I would suggest adding a few words that the temperature sensitivity is due to the oxygen absorption

p. 3732, l.5-9: You should mention that the model calculations are based on radiosonde soundings. How many soundings were made per day? Are the MWR data averaged over the duration of the radiosonde ascent? Please comment on that! Same for Fig. 12 (text on p. 3737) and Fig. 15!

p. 3739, l.6: You should add that the degrees of freedom for water vapor profiles also strongly depend on the total amount of water vapor (IWV). In mid-latitudes the average is <2, in the Arctic probably very close to 1.

Figure 13, also p. 3737, l.17-18: The figure caption as well as the explanations within the text are very short. Please provide more details on what the different comparisons represent!

Technical corrections:

p. 3731, l.12: I would add a new paragraph here, starting with “The ARM program (...)”

p. 3732, l.17-21 (from “Red crosses (...)” to “(...) MWR3C sensor”) - > this part should be in the figure caption

p. 3736, l.21, 22 : “above and below the -40°C level” might lead to confusions. Better say something like “in levels warmer/colder than -40°C”

p.3737, l.13: Replace “On the right panel” by “In Fig. 12b”

Figure 3: This diagram is already available in Cadeddu, 2011 and does not need to be presented here again.

Figure 8: The grey points representing the MWR rain flag are very faint and only barely visible. Maybe you could improve that?

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