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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Technical Note: Novel method for water vapor monitoring using wireless communication networks measurements" *by* N. David et al.

N. David et al.

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The authors would like to thank the referee for the positive response to the paper and for the useful comments.

Comment: "p 11677, l 24/25: You state that the attenuation Aw can be "assessed" from gamma using Eq.(1). well, Eq.(1) just states that Aw = gamma since Ao is neglected. So it is rather simply "equating" Aw with gamma; or did I miss some details? The word "assess" suggests something more complicated than just Aw =gamma, which confused me. To me, the key equation then is eq.(2) linking Aw with N"(p, T, rho); so this is used in order to convert the measured attenuation gamma into the water vapor density rho."

Response: Ao (the attenuation created as a result of Oxygen) is in fact negligible in

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respect to Aw (the attenuation created as a result of water vapour), nevertheless the algorithm also takes into account Ao (please also see the comment given to Referee #2 on this topic, page S7439). Since this is the case, we included the term Ao in the equation as well. In the modified version of the paper the wording will be amended to clarify this point.

Comment: "p 11679, l 20/21: You state that "similar comparisons were performed for other links"; can you tell which ones, and how many?"

Response:

1) Link ID: Kfar Bialik, location: north Israel, number of measurements: 29, month/year: 06/2008, correlation: 0.76

2) Link ID: Kfar Bialik, location: north Israel, number of measurements: 31, month/year: 05/2008, correlation: 0.87

3) Link ID: Harduf*, location: north Israel, number of measurements: 22, month/year: 12/2005, correlation: 0.78

4) Link ID: Ramla*, location: central Israel, number of measurements: 27, month/year: 11-12/2005, correlation: 0.66

5) Link ID: Tzrifin, location: central Israel, number of measurements: 25, month/year: 09/2007, correlation: 0.89

Notes:

- The two links indicated by * are the links referred to in the article (links located in the north and center of Israel respectively). The results presented here are from a different time period.

- The number of measurements indicated for each link corresponds to the number of measurements acquired during the same month.

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Comment: "p 11680, l 2: Only one signal is captured in 24 hours for these specific links; is this typical for such microwave links? This would give rather poor temporal resolution for humidity measurements, I think."

Response: Yes, it is typical for such microwave links. The cellular operator's system is currently configured to save a measurement only once every 24 hours. This, however, is a technical configuration issue, it is possible to save data at shorter intervals.

Comment: "p 11680, l 5: "close by surface stations" - how close by (a few km, or less than a km?)"

Response: The precipitation data were taken from meteorological surface stations that are a few kilometers away from the microwave links. The data for the northern site were taken from two different surface stations situated 7 km and 12.5 km away from Harduf. Both stations indicated rainfall during 7 and 22 November 2005 and during the relevant hours. In the central site case, the data were taken from a surface station located 13 km away from Ramla indicating precipitation during 5 and 19 May 2007. In all the aforementioned cases an additional signal attenuation which is not typical to the attenuation caused by moisture was observed. Therefore, as mentioned in the text, these cases were omitted assuming rainfall caused the phenomenon.

Comment: "p 11680, l 7-18: In general, the results from the Ramla link match the station measurements much less well than the results from the Harduf link. Can you comment on that? Is the humidity gauge closer to the link here? (The maps in figure 1 do not suggest that.) In particular, on May 1 and on April 23, the discrepancy is almost as large as on May 6 (the case you discuss) but with opposite sign. Can you comment on that?"

Response: In general, there appear to be links which have higher potential for monitoring moisture than others and further investigation is needed regarding this point. In particular, the humidity gauge is not closer to the link in this case, but the representativity of the humidity gauge at that station might be the cause of the difference between

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the two measurement methods. Also, as mentioned in the text, the humidity gauges in the standard ground stations are located around 2 meters above ground level and as a result can be affected by local surface perturbations.

We wish to thank the reviewer for the other important technical remarks given, we will adjust and edit the final version of the article per these notes.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 11673, 2008.

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