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Interactive comment on "Using Markov switching models to infer dry and rainy periods from telecommunication microwave link signals" *by* Z. Wang et al.

Anonymous Referee #2

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General comments: This paper presents a good primer on the use of microwave radio links as a method for estimating the rain rate along a given path, and clearly places the use of this method in the context of other rain measurement techniques such as rain gauges (point rainfall) and rain radar (measuring rain in volumes and over areas).

It is well known that microwave links experience attenuation from sources other than rain (including clouds and atmospheric gases), especially as one gets up to frequencies such as the one used in this study (38 GHz). It is therefore important to be able to use the link itself to determine whether or not the attenuation it is experiencing is the result of rain or some other effect. Markov switching models are compared with other existing

algorithms and are concluded to perform well.

The experimental set-up here is of intense interest, and I sincerely hope that the measurements will continue to be made over a long period of time, as they have the potential to provide significant insights into the development of fade mitigation techniques and rainfall retrieval techniques.

Specific comments:

Why was a 4 second temporal resolution chosen for logging the attenuation, rather than 1 second or 5 seconds?

Antenna wetting is indeed a problem, and results (in my experience) in a characteristic exponential tail in the attenuation signal at the end of the rain event. Perhaps this characteristic tail could be used to detect antenna wetting and compensate for it?

I am very pleased to see the authors intentions to make the experimental data publicly available via web platform once the experiment is completed. I would strongly encourage them to avoid re-inventing the wheel, and instead submit their data to an appropriate data archive who can then issue the dataset with a formal citation and permanent id (DOI), giving them credit for their efforts in building, maintaining and processing the dataset.

The selected datasets used in the analysis are quite short, and are limited to spring and summer months. Annual and seasonal variability of rain is very high, so it would have been good to have seen tests of the algorithms done across an entire year of data. This would also allow a more accurate estimation of the amount of time the non-stationary cases represent.

In figures 2 and 3, the path attenuation seems excessively high given the low rain rates and the short link length.

I would also like to see a further investigation into the unstationary cases, to determine what the variable baseline is correlated with, and whether there is a method for pro-

cessing the unstationary case data to make it stationary, as this would reduce type I and type II errors. Future work, perhaps.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 411, 2012.