

AMT

"Studying anomalous propagation over marine areas using an experimental AIS receiver set-up"

Laura Rautiainen et al.

Review on revised version 1

I appreciate most of the changes and explanations by the authors. The manuscript certainly improved by the recent revision. Many of the comments of all three reviewers have been addressed properly also in the manuscript.

My remaining concerns and comments are:

Rev#2 :L62 "... behave in unexpected ways" means what?

"... behave in unexpected ways" still exist - it's still not explained in the manuscript, what is meant by this phrase.

Rev#2:

L207- I'd suppress all the data below 10km (at least!) as the local harbour spoils the statistics and as you're rather after "anomalous" propagation these distances are not useful anyway.

Authors:

The figure here is mainly included to illustrate the overall data and where from the messages are received prior to any exclusions. This justifies excluding the nearest 1 km from the analysis as the harbour on the island pollutes the data. Excluding 10 km from the data could potentially hide other forms and effects of anomalous propagation, such as subrefraction.

Rev#2:

I still don't agree. These close distances have nothing to do with tropospheric long distance ducting, what you are after in this manuscript, nor will it contribute additional knowledge or understanding of it.

Rev#2:

Sect3.6 I'm not too convinced, what has been learnt from the global AIS, this probably

needs to be clarified more clearly.

In that light, for the global AIS as it is comprised of spaceborne and terrestrial data -

during ducting, I'd bet quite some of the AIS signals are not received by the satellites, but at

the same time more terrestrial detections will exist, which compensates?...

Authors:

Thank you for the comment, please see the answer to L125 comment.

Rev#2:

That's not really answering my question.

I was hypothesizing that with the presence of the tropospheric duct, there might be less AIS signals detected by the satellites as the signals are refracted and not propagating to the spacecraft.

On the other hand other coastal stations that are included in the global AIS (???) will add more information due to the tropospheric ducting... right?

That's what I meant with "it might compensate".

Rev#2:

Fig15 another candidate for the appendix or to be removed as it's basically a scaled version

of Fig14. What do we learn from this Fig? Again, just less observations/coverage.

in the right panel, why are there distances near 0km, when it's about OH grids?

Authors:

Thank you for the suggestion on how to condense the study. We have moved Fig. 15 to the appendix.

Rev#2:

Yes, you've moved the Figure, but you did not answer or reasoned, why there are counts for extremely close grids - less than 10km - IF/AS you refer to them as "grids OH".

You're describing a radio horizon, different for each direction, due to the antenna mast, topography etc., which is then altered (enhanced!) to larger distances.

So, why are distances below 10km relevant ? These distances are just confusing and adding nothing to e.g. ducting.

Rev#2:

L330 "However, it is unclear if the anomalous IAS" Why unclear, what else should it be?

Authors:

Thus far in the study, it has not been shown to be caused by ducting, as the OH observations could also result from other processes, e.g. troposcatter

Rev#2:

Formally true, as you want to verify ducting with the temperature profile etc. Fair enough, but I wouldn't formulate the sentence that strict.

"is unclear" - perhaps you mean "unproven" ?!?

Btw. to my understanding we'd also need a bit larger radiated power than it is used for AIS for efficient tropo-scatter, ducting is WAY more efficient!

Rev#2:

Fig17 again, why are there distances near 0km? It's certainly not the type of ducting (over hundreds of km) you're aiming for  
I'd also move the 2nd panel to the appendix, if needed.

Authors:

Only the nearest 1 km is excluded from the study. The data is shown in 10 km intervals and hence there is 0-10 km interval where data is 1-10 km. We think that the 2nd panel should be included as it demonstrates the differences between heights.

Rev#2:

I still don't agree that anything below 10km is important for this study. As you want to keep the now Fig.14 with both panels - why are there no 95 perciles at distances below 60?km for the higher mounted antenna? This is not consistent, at least.

Fig.13 : if it stays at full page width it's probably fine, but if it's going to be shown differently I suspect it will be hard to see details in panel (c).

I had hoped that it would be less "outside the scope of this publication", but instead I still would have liked to see a little more discussion and comparison with other studies.