

## ***Interactive comment on “Technical note: A sensitivity analysis from 1 to 40 GHz for observing the Arctic Ocean with the Copernicus Imaging Microwave Radiometer” by Lise Kilic et al.***

### **Anonymous Referee #3**

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This technical note presents a sensitivity analysis of geophysical parameters relevant to the frequencies and viewing geometry anticipated for the arctic-focused CIMR mission. The focus of the work is a more quantitative reproduction of the classic Wilheit 1979 figure using more up-to-date information including RTM and inclusion of the atmospheric contribution. The note finishes with anticipated single channel TB sensitivity to the CIMR precision range for desired retrievables. The paper is well written and the results reasonably well presented. The information is highly useful for the CIMR team and future users of the data. The paper is lacking in scientific novelty for a publication. Suggestions are given below for some possible expansions that could add to the contribution of this work.

C1

Specific Comments: Line 65: What are some of the uncertainties and sources of error associated with this?

Line 96: I understand the desire to present a single case here with explanation before diving in to the comparisons, but using the midlatitude case seems an odd choice here. I suggest reorganizing this section and either presenting 3 versions of Figure 2 (one for each of midlatitude/arctic/tropical) or (perhaps more in line with the original idea) leave the first section as "a general case" but average all areas together, making it truly general for this discussion, then next presenting Figure 3 teasing them all apart and discussing the latitudinal differences.

Lines 106-109: Is this the best place for this discussion? May be better placed in the introduction?

Section 3 - General: Please add a sense of the variability in these parameters, and how this variability differs for each of tropical/mid-lat/arctic. This is an important piece that is missing to make this more robust.

Section 3 - General: More discussion of differences from the Wilheit figure and how the changes are related to the updated technique and inclusion of the atmospheric contribution (more than the quick mention at line 101) would be a nice addition to this work.

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