

Referee #2:

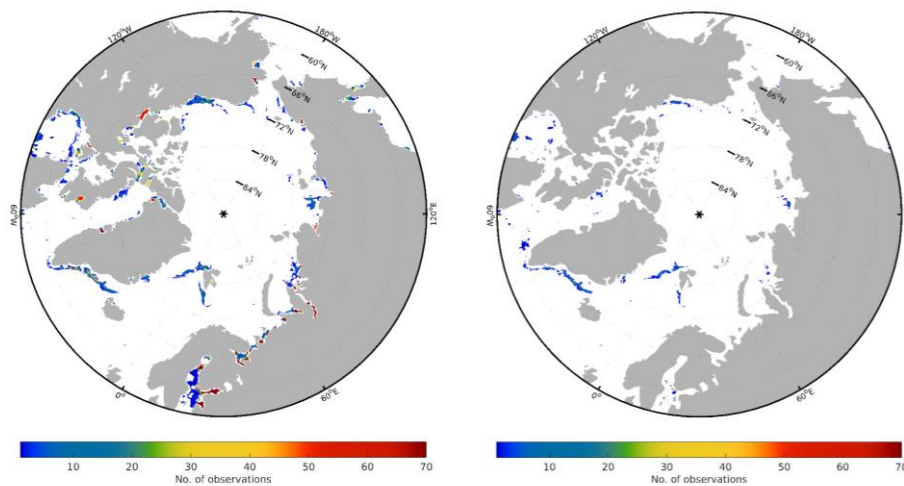
General Comments

This is an exceptionally well-written contribution; if only all papers were so clear. The datasets collected seem very comprehensive, and the careful attention to uncertainties in satellite estimates is a strength, as is the good practice of independent validation of both the data and the data uncertainties. The value of this observational effort (compared to just taking re-analysis outputs) is demonstrated. The conclusions are well supported by the discussion.

Specific Issues

8.5 - Why should surface melting situations necessarily be excluded? How common is the situation of the (wet) skin temperature being > 5 deg compared to it being a wrong observation? I guess this is explained more in the reference, but perhaps a little more comment here would be justified.

The skin temperatures warmer than 5 deg are usually located along the coasts and sea ice edge, and not representing warm (wet/melting) ice, but indicating inconsistency between the ice mask used and the surface temperatures. The sea ice mask is based on the coarser resolution OSI-SAF product, which is subject to land-spillover effects (see left figure below). Better spatial resolution (as for SICCI-25km) reduces the spurious ice along the coast (see figure to the right). Here, the warm (>5 deg) surface temperatures have been used as a filter to minimize the cases of spurious ice. This sentence of the manuscript has now been reformulated and the above explanation has been added to the manuscript as well. Thank for pointing this out.



Number of observations with coincident CCI SST $> 3^\circ\text{C}$ and SIC $> 15\%$ for OSISAF (left) and SICCI-25km (right) during 2009.

Figure 4 includes open ocean areas, so this presumably is the SD of any surface present not of specifically ice surfaces, despite the wording of 8.12? **Yes, this is correct and the sentence has been reformulated.**

"Daily mean" surface air temperature data from weather stations are often actually the mean of the daily max and daily min reported. Is that the definition applied to the in situ data in section 3.1 here? **No, here the "daily mean" is actually the average of all observations available for the given day (e.g. the hourly observations provided by PROMICE). This has been stated in 4.30.**

Technical / editorial

1.10 - unnecessary hyphen after weather. **Deleted**

1.11 - meter -> metre and also throughout eg 8.25 etc; reserve "meter" for an instrument.
Accepted

2.23 - micron -> micrometre. **Accepted**

Figure 4 caption: not totally unambiguous what calculation this is, but I think it is the SD for the named month of each year, then averaged over years? **Yes, this is correct and the caption has been updated.**

12.3 -- explain "theoretical shortwave radiation" -- is this top of atmosphere to give seasonality?

Yes, it is the theoretical top of atmosphere shortwave radiation. This has now been stated in manuscript.