

Review of Version 2 “Seasonal cycle and long-term trend of solar energy fluxes through Arctic sea ice” by S. Arndt and M. Nicolaus

General Comments

The authors have made a considerable effort to improve their manuscript, taking into account both reviewer’s comments. I therefore recommend that the manuscript should be accepted following minor revisions.

Major Comments

The English is still awkward. This was pointed out by Referee #1 in their original review, but I don’t feel that it has been adequately addressed in the author’s resubmission. I reiterate that it would be useful for someone to edit the manuscript purely to improve the written English. This isn’t only an issue in a few places, but throughout the manuscript.

Minor Comments

Abstract.

Throughout the abstract you should explain your points fully. Often it is very hard to understand what you are trying to articulate (examples are given below). Remember, people are going to read the abstract before deciding whether to read the full paper. It should therefore be simple and clear, otherwise it will put off potential readers.

Line 30. Remove ‘sufficiently well’. Remove ‘here’.

Line 32-33. Confusing sentence. Is this ‘30 cm ice melt per month’ only for June? Or an average of 30 cm per month for the entire summer? If it’s the former, maybe just remove ‘per month’.

L 37-38. What does this sentence mean? 63% more bottom melt occurs now than it did 33 years ago? Where has this figure come from? What is ‘potential’ sea ice bottom melt?

L 42. Like I said before, what about the annual budget is it that increases? The whole budget could increase (more energy gains, more losses) without a net surplus or deficit. I think what you are trying to say is that the surplus of radiative energy available to the ice increases by 20%.

For the final two sentences of the abstract you should report either changes in light transmittance or changes in the surplus/deficit of energy. I recommend the latter.

Manuscript.

L 164-165. This is from Rosel et al? It is the same std dev for both FYI and MYI?

L 464. A validation is typically performed to test the reliability of the method and is therefore reported before the major results, not in the discussion. Since this section is more of a comparison between your predictions and limited observations, you may want to change this section to 'Comparison with Field Observations' or something, instead of validation.

L 520-537. These comparisons are fairly weak and add very little to the paper. You should consider removing them.

L 539-556. These paragraphs are not validation or a comparison with results, more a discussion of the limitations of the parameterization and possible improvements when new datasets become available. You should consider creating a new 'limitations' section for this material.

Figure 2b. The 'melting MYI' curve appears to go back in time at the end of Stage IV.