

## ***Interactive comment on “Comparison between MODIS and AIRS/AMSU satellite-derived surface skin temperatures” by Y.-R. Lee et al.***

**R. Iacovazzi, Jr. (Referee)**

robert.iacovazzi@noaa.gov

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This paper represents a valuable analysis that can be used by climate scientists and land and sea surface temperature algorithm developers. I recommend publishing it after the following questions and comments have been addressed:

Editorial Comments 1) Use of the "~" symbol is typically associated with an approximate value of a measurement, not to represent a range of values. Please use a hyphen (-) or the word "to" in order to express a range. For example, "I run from 4-6 miles a day," or "I run from four to six miles a day." 2) Page 7435 Line 15 - "-10C to -50C". Do you mean +50C here?

Technical Comments 1) Page 7432 - The uncertainties related to the analysis shown in Tables 1 and 2 in many cases eclipse the significance of the results. This needs to be stated very clearly, even in the abstract. 2) Page 7432 - The conclusion is that the difference between MODIS and AIRS/AMSU SST products lies mainly due to snow/ice emissivity. Don't both algorithms attempt to account for emissivity issues? The study clearly shows the effect happens over sea ice regions, as opposed to land ice regions. Why would this be so, if the microwave emissivity is effected by ice, regardless if it is over land or ocean? 3) Page 7434 Section 2 - It is good that instrument specifications - swath width, orbit LECT, channels, etc. - have been added to the text for the reader. On the other hand, I don't think references to documents containing these instrument specifications are necessary. I would get rid of those references. 4) Page 7434 Line 24 - AIRS/AMSU have measurements in radiance. What is the difference between AIRS/AMSU radiance measurements and cloud-cleared radiance? 5) Page 7433 Line 14 and Page 7439 Line 27 - You bring up the fact that MODIS SST and AIRS/AMSU SST are actually not measuring the same parameter. The MODIS product measures bulk temperature, and AIRS/AMSU measures skin temperature. Could this account for large temperature differences in the Arctic Ocean during sea ice conditions? Please provide and explanation to your answer. 6) Does the AIRS/AMSU SST product have a sea ice flag? 7) Page 7437 Line 6 - The phrase "are not shown." Do you mean "do not exist?" 8) Page 7838-7840 Section 4 - It seems like there are many differences between the L3 data sets (cloud-cleared IR MODIS versus partially cloudy AIRS/AMSU, time-of-day, etc.) that can add substantial variability. Are the authors aware of any SST or LST studies that compare MODIS SST or LST with those of AIRS/AMSU for exactly the same scenes, scan angles, time-of-day, etc.? This may shed more light on the actual biases between the data sets. If there are studies, I recommend to incorporate references to them into this paper. 9) Section 4- Many effects are mentioned that cause discrepancy in the analysis. Are there other issues - e.g., instrument view angle differences, broken versus solid ice? I would recommend adding comments regarding these effects as well if they are relevant. 10) Page 7442 Conclusion - What is the next

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step? Would you give any advice to algorithm developers or climatologists? I would recommend to add this to the conclusions.

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