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Interactive comment on “Inter-comparison of IASI and AATSR over an extended period” by M. Bali et al.

Anonymous Referee #1

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The authors investigated radiometric calibration reliability of AATSR on board Envisat and IASI on board Metop-A satellites. They focused on the inter-comparison of 11 and 12 micron channels of AATSR and IASI. They found that brightness temperature bias of 11 micron channel between AATSR and IASI is close to that measured in AATSR pre-launch test, after taking into account an offset of 0.07 K which could be attributed to IASI itself. They also developed an empirical technique to correct scene dependent brightness temperature biases of 12 micron channel. The data used in this study represent the consistency with earlier studies. In general, the article will be of interest to researchers who produce level-1 satellite climate data record or develop inter-calibration methods.

I have the following concerns.

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1. The authors developed a new collocation algorithm for the inter-comparison. Their approach which takes into account the exact IASI field of view can reduce uncertainty due to spatial mismatch between the two instruments. However, an explanation of the test bed which uses two scenarios is not easy-to-understand. Is the first algorithm performed just to confirm the algorithm (software) function? How to simulate “scenes in which the expected number of collocations in the larger pixel was already known”?

2. I think scan angle dependence of brightness temperature bias shown in Figure 2 is computed from both forward and nadir view data. The paper would benefit from additional figure or explanation which clarifies the differences between these two view data. it would be useful if the authors added.

3. It is not clear how the authors derived an offset of -0.130K which is applied to the AATSR-IASI 11 micron channel variation curve.

4. The authors concluded that collocation data over Greenland contribute to clear temperature trend at cold scenes. Are there any possible reasons on this temperature dependent bias such as number of collocation data because there is still some variation after removing data over Greenland (i.e. bottom panels of Figure 8)?

5. The authors concluded that “higher latitudes of Southern Hemisphere are not good target areas for detecting geo-location errors.” It would be useful if the geo-location errors at the higher latitudes of Northern and Southern Hemisphere could be shown.

6. Uncertainty is very important for the instrument calibration. Please clarify what the uncertainties mean (e.g. 0.0814 on page 9803, line 27).

The following are minor comments.

a) Please standardize satellite and instrument names. For example, ‘MetTop-A’ on page 9786, line 2 and ‘METOP-A’ on page 9791, line 4 should be ‘Metop-A’.

b) The reference relevant to GSICS (e.g. Goldberg et al. 2011: The Global Space-Based Inter-Calibration System. Bull. Amer. Meteor. Soc., 92, 467-475.) should be

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included on page 9787, line 26.

c) In the GSICS community, IASI on Metop-A satellite is a reference instrument for INFRARED channels. This should be noted on 9787, line 27.

d) Aqua satellite, which equips AIRS, was launched on May 4, 2002 (c.f. <http://aqua.nasa.gov/>). “2000” on page 9788, line 22 should be corrected.

e) The authors should check the references. For examples, the author’s name should be Illingworth and not Illingsworth on page 9788, line 28. On page 9807, line 9 ‘IAS’ should be ‘IASI’. The author’s name should be Wang and not Want in Table 2. There are other similar problems that require attention.

f) Please review your spelling. For example, on page 9789, line 22 ‘weather’ should be ‘whether’. ‘a a few’ and ‘hundreth’ on page 9797, line 7 should be ‘a few’ and ‘hundredth’. There are other similar problems that require attention.

g) Envisat mission ended on 08 April 2012 (c.f. <https://earth.esa.int/web/guest/missions/esa-operational-eo-missions/envisat>). ‘May 2012’ in line 8 of 9790 should be corrected.

h) On page 9793, line 15 ‘1’ should be ‘1 K’.

i) One page 9794, line 18 ‘Metop-B’ should be ‘Metop-A’.

j) What the error bar in each figure represent should be explained.

k) According to Figure 3, ‘-0.075 K’ on page 9796, line 16 and page 9797, line 8 is expected to be ‘0.075 K’. l) ‘Temp > 230K’ on page 9798, line 19 is inconsistent with ‘ranges (< 230 and > 240 K)’ on page 9798, line 17 and Figure 6.

m) On page 9804, line 4 ‘These are shown in Fig. 9 below’ should be removed and ‘This figure’ on page 9804, line 6 should be ‘Figure 9’.

n) Y-axis in Figure 9 and 10 is expected to be changed from brightness temperature to

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radiance for easy understanding.

o) Some abbreviations such as BT and SNO are used without definition.

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