

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

M. Bali et al.

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We really appreciate the anonymous reviewer for his thorough review, constructive suggestions, and inspiring comments. We truly believe the quality of the paper will reach a new level by integrating comments from all the reviews. Comment 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”?

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Answer: Line 201 – 220 , A paragraph with figure has been added to illustrate the test bed and how scene for which number of collocation is already known has been generated.

Comment 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.

Answer: Yes Fig 2(now Fig 3) has been generated from both forward and nadir view data. Line 146-153 give an explanation of the two views of the data. References have been provided in the section 2.1 most of which have figures of conical scanning geometry of AATSR so a figure of scan has not been added to avoid duplication.

Comment 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

Answer: In Line 360-365 The following text has been added to explain the method of getting the offset. The -0.11 K offset has been computed by minimizing the root mean square(RMS) difference between the post and the pre-launch and the post launch (AATSR – IASI) curve. A series of RMS difference between post and pre-launch values was calculated by adding successively 0.001 K offsets to IASI temperature and reducing the AATSR-IASI bias. The minimum value of RMS difference occurs when at an offset of -11K.

Comment 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)?

Answer: The Figure 8 is now Figure 9. The clear reason of this anomaly is not fully understood. From a point of view of identifying reference radiances we exclude the

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Greenland.

Comment 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.

Answer: The authors accept the reviewer's comment and feel that this conclusion/statement is outside the scope of this study hence has been removed. However it is pointed out that even if there were geolocation errors. In the southern hemisphere these would not show up in the inter-comparison due to low spatial gradients in temperature values in this region as it is an ocean surface.

Comment 6. Uncertainty is very important for the instrument calibration. Please clarify what the uncertainties mean (e.g. 0.0814 on page 9803, line 27). Answer: Line 630-640: Clarified the uncertainty

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'.

Change has been made b) The reference relevant to GSICS (e.g. Goldberg et al. 2011: The Global SpaceBased Inter-Calibration System. Bull. Amer. Meteor. Soc., 92, 467-475.) should be Change has been made 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. Change has been made 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. Change has been made 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 Change has been made f) Please review your spelling. For example, on page

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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.

Change has been made 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. Change has been made h) On page 9793, line 15 '1' should be '1 K'. Change has been made i) One page 9794, line 18 'Metop-B' should be 'Metop-A'. Change has been made

j) What the error bar in each figure represent should be explained. Change has been made 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'. Change has been made l) 'Temp > 230K' on page 9798, line 19 is inconsistent with 'ranges (< 230 and > 240 K)' on page 9798, line 17 and Figure 6. Change has been made 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'. Change has been made n) Y-axis in Figure 9 and 10 is expected to be changed from brightness temperature to C3291 AMTD 8, C3289–C3292, 2015 Change has been made o) Some abbreviations such as BT and SNO are used without definition Change has been made

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 9785, 2015.

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