



MEMORANDUM

From :	IDEAS+ AATSR QC Team	Document Ref :	IDEAS+-VEG-OQC-MEM-2528
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COLOCATION STATEMENT FOR THE (A)ATSR THIRD REPROCESSING

The following quality statement on nadir/forward view colocation within the (A)ATSR third reprocessing dataset has been approved by the AATSR QWG:

- Nadir/forward view colocation has been improved
 - AATSR retains an along-track shift of 1 pixel
 - ATSR-2 and ATSR-1 best-fit empirical offsets are within 1 pixel

Analysis

The plots in Figure 1 give the empirical best-fit global pixel offsets of the forward view relative to the nadir view for (A)ATSR. The along-track direction is positive in the satellite flight direction; the across-track direction is positive moving to the right perpendicular to the flight direction. Users should be aware that different viewing and reading software may invert these directions.

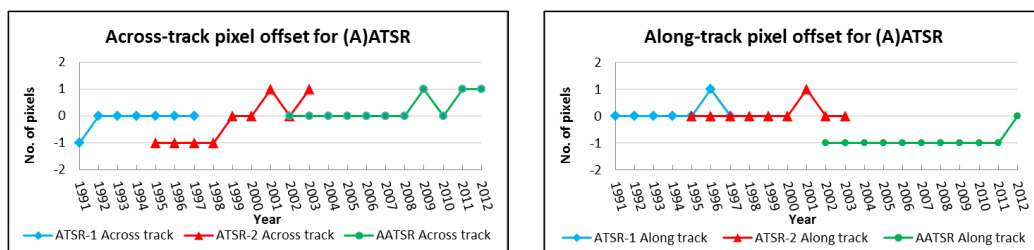


Figure 1. Across-track and along-track pixel offsets for ATSR-1, ATSR-2 and AATSR, from the 11- μ m channel of the 3rd reprocessing dataset (O. Embury, pers. commun.).
Analysis by the ESA SST CCI team

It should be noted that the offset varies within any single orbit, and that some of the fluctuations in the obtained best-fit in Figure 1 could be statistical. Variations in the offset between the nadir and forward views could be due to changes in the attitude control of the mission for certain periods of time, however without further investigation this hypothesis is unconfirmed.

Note: The assessments shown above were performed on the image grid data (i.e. as provided in the TOA/NR products) and are only valid for sea level.

The images in Figure 2 give an illustration of the offsets for AATSR, showing the improvements obtained in the 3rd reprocessing (compared to data from the 2nd reprocessing).

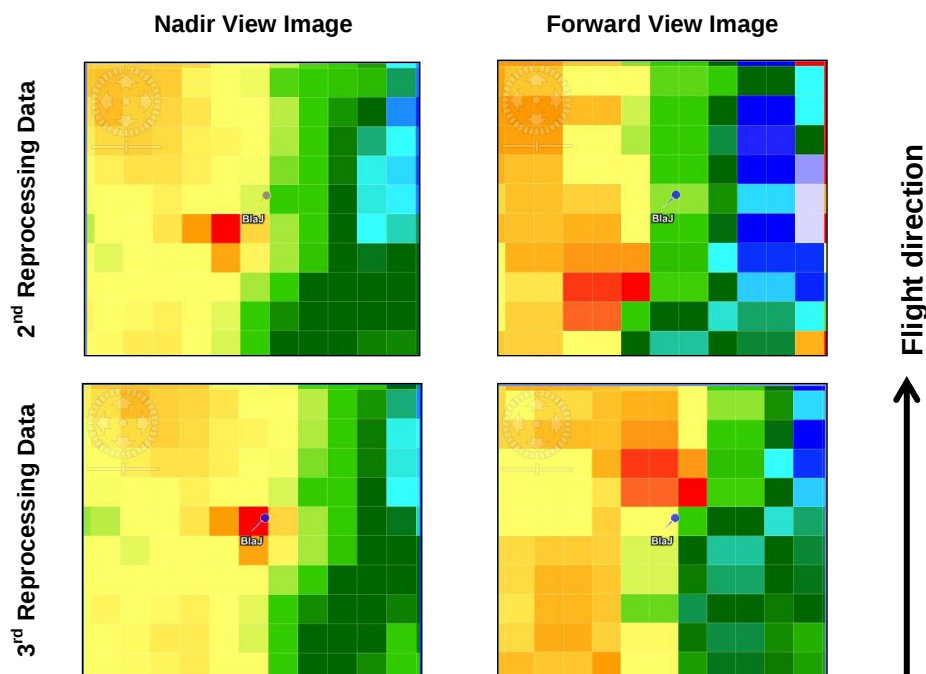


Figure 2. Blå Jungfrun¹ island pixels (red) in AATSR 12 µm BT images, for nadir and forward view data from the 2nd and 3rd reprocessings. The pin (labelled BlaJ) is placed at the geographic centre of the island. (Data taken from L1 TOA product on 1st June 2009, product orbit 37922.)
Analysis by the IDEAS+ QC Team

The images in Figure 2 show that both the nadir and forward views are now closer to the geographic location of the island, and hence are closer to each other. The distance between the location of the feature in the nadir and forward views has decreased from 2.2 to 1.7 km. However, the forward view seems to have been over-corrected, and hence could be improved further. The arrow in Figure 2 displays the flight (along-track) direction.

It is accepted that there is room for improvement in the AATSR view colocation. The planning for the 4th reprocessing of (A)ATSR data includes the implementation of ortho-geolocation (pixels geolocated to a DEM) for all three instruments, and will also use updated auxiliary information. This is expected to result in improved view colocation (and absolute geolocation) which will be investigated as part of the quality assessment of the 4th reprocessing dataset.

Note: For a thorough comparison of the view colocation (and of absolute geolocation), the data should be transformed back to the instrument scan coordinates. The AATSR FAQ (Issue 3) contains information on how to do this.

If further information is required, please contact the ESA EO Help Team at <https://earth.esa.int/web/guest/contact-us>

¹Blå Jungfrun is an island that is 1.15 x 0.84 km in area, 86 m above sea level and located at 57.2519° latitude, 16.7925° longitude.