

*ALOS KYOTO & CARBON INITIATIVE*  
*SCIENCE TEAM NEWSLETTER NO. 3 (JULY 2007)*



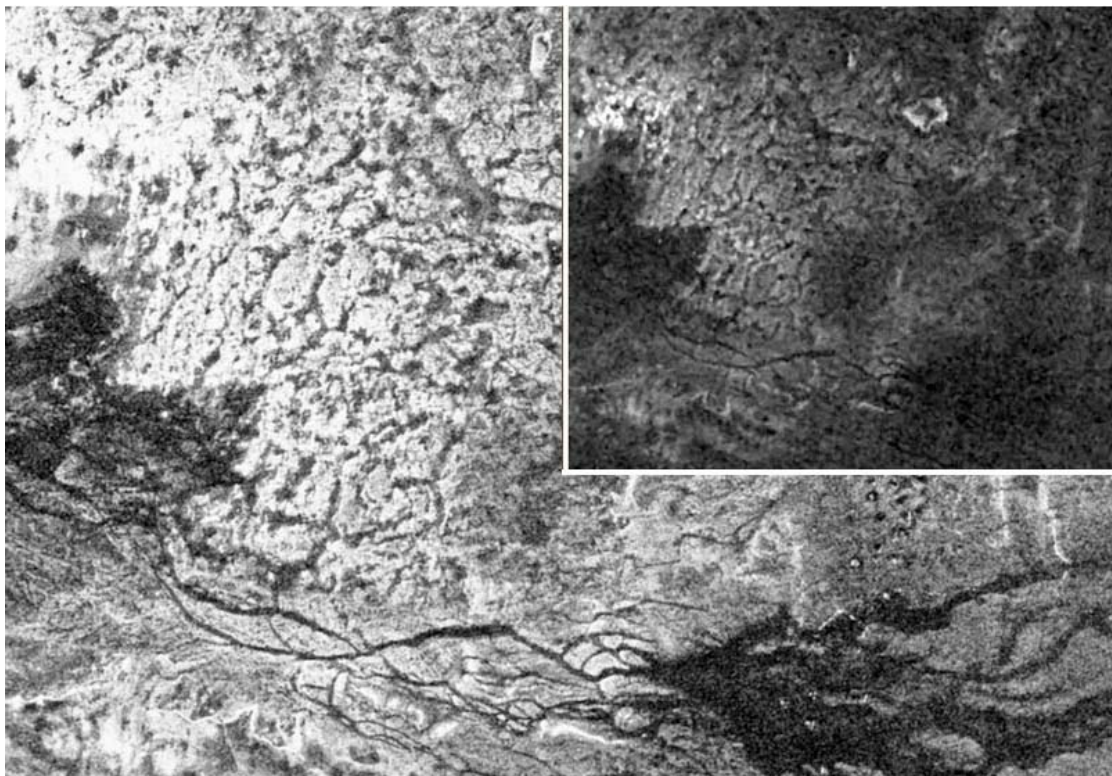
*Dear K&C Science Team members.*

*Best (N hemisphere) summer greetings! I hope this newsletter finds you all well. It contains a summary of the main points covered at the past science team meeting a month ago, an update of some other issues of relevance, as well as a photo gallery of who-is-who at JAXA and RESTEC. Please note that the newsletter contains 3 attachments.*

*Comments are most welcome, as always.*

*Best regards,  
Ake Rosenqvist*

[Image of the Month](#)



*PALSAR data (FBS 34.3°) acquired in January, 2007, over a hyper-arid region in northern Sudan (N22°/E27°). A JERS-1 SAR scene over the same site is inserted. Due to its improved NES0 and finer resolution, PALSAR penetrates deeper and reveals subsurface geomorphology better. The image shows a possible ancient flood valley.*

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## The 8<sup>th</sup> K&C Science Team meeting

The 8<sup>th</sup> Science Team meeting was held in Tsukuba on June 11-13, 2007. Many thanks to those who could participate, and to those who contributed by providing material. The agenda and all presentations are available on-line at:

[http://www.eorc.jaxa.jp/ALOS/kyoto/jun2007\\_kc8/kyoto\\_meeting\\_2007jun.htm](http://www.eorc.jaxa.jp/ALOS/kyoto/jun2007_kc8/kyoto_meeting_2007jun.htm)

One of the main objectives of the meeting was to clarify various pending issues regarding processing, data formats etc. and as a result of several of the issues brought up at the meeting, EORC temporarily suspended K&C product generation to upgrade the processor. Below follows a summary of the major points discussed.

## Processing issues

### **Processing shedule**

Processing of K&C strip (path) data began in May and the capacity at EORC was reported to be about 30 strips/working day, or about 1000 strips/satellite cycle.

Processing was suspended on June 11 to tend to the data issues raised at the KC#8 meeting - which are discussed further below - and it is planned to be recommenced on August 1, following upgrade of the SigmaSAR processor.

In an attempt to minimise the impact of the delay, EORC will start processing from cycles 11, 12 and 13 (22 April – 6 Sept), which are the cycles when most of you have requested data – some 3000 passes – after which they will continue with the backlog data from cycles 10-7 (in reverse order). Once the backlog data have been processed, EORC will begin processing data from cycle 14 and onwards.

Your data will be kept on-line on your FTP directories for 1 year after upload.

## **Modification of processing requests**

In order to optimise processing, we have during the spring and since the last meeting made modifications to your processing requests. As many of you have requested data over the same areas and during the same cycles, but with some minor differences in terms of the lengths of your strips, your requests have been aligned to each other as far as possible to minimise duplicate processing by EORC. While none of you will receive less data than you requested, some of you will receive longer strips than you initially asked for. We have by this been able to reduce the processing load for FB data by some 10% and for ScanSAR by 40%. I will send out your modified request sheets to each of you this week, including PDF plots for visualisation.

## **Appeal**

In order to further reduce the processing load and speed up delivery, I would like to appeal to each of you to make a candid assessment of your own processing requests. In particular, given fact that data from the backlog cycles 7-10 will be delivered after that of cycles 11-13, I believe that some of these requests by now may have rendered superfluous for you. Please have a close look and let me know if there are any **requests** for cycles which you no longer need and **which we may cancel**. That would help us a lot. Thanks in advance.

## Image characteristics

Note that the characteristics of the PALSAR data (image orientation, byte order, header info) generated by JAXA varies slightly depending on observation mode and product level, and whether the data were generated by EORC (K&C products) or by EOC (JAXA standard products). In summary as follows:

### **K&C strip data - Ascending passes (FBS and FBD)**

- North at image bottom
- *East-West reversed*
- No header in image file
- Number of pixels and lines according to HDR file
- 16 bits Unsigned Short Integer, with *Pentium byte order (LittleEndian)*

### **K&C strip data - Descending passes (ScanSAR)**

- North at image top
- *East-West reversed*
- No header in image file
- Number of pixels and lines according to HDR file
- 16 bits Unsigned Short Integer, with *Pentium byte order (LittleEndian)*

### **JAXA standard products (full resolution level 1.1 and 1.5 data ordered via AUIG)**

- North at top
- East-West “correct”
- 720 byte header in image file
- Number of lines according to summary file
- **Add 96 pixels** (per image line) to the number of pixels given in the summary file
- 16 bits Unsigned Short Integer, with *Motorola byte order (Big Endian)*

## Geometry

### **Product pixel spacing**

The pixel spacings for the different products are given in the table below. Note that the pixel spacing varies with acquisition mode and processing level.

Note also that the pixels are not square, but that the range and azimuth resolutions differ. This is the case not only for slant range (SLT) data, but also for ground range (GRD) and orthorectified (ORT) strip products. While this may be somewhat awkward to handle, the reason for this choice is to maximise range resolution (azimuth resolution is fixed in the SigmaSAR processor), while minimising processing time by avoiding an additional resampling step. You are encouraged to undertake the final resampling yourselves, if you so require.

### **Incorrect header info**

The pixel spacing information given for K&C data in the header (HDR) files is incorrect for data processed up to June 11, listed as default values of either 50 m or 100 m. The error has been corrected for in the upgraded processor.

**Table 1: PALSAR strip product characteristics**

| MODE<br>(file name)  | RANGE<br>spacing [m] | AZIMUTH<br>spacing [m]                                 | N <sub>looks</sub>             | Image orientation                           |
|--|----------------------|--|--------------------------------|---|
| <b>Slant Range: SLT</b>                                    |                      |  |                                |   |
| <b>FBS</b><br>sar.Q16_64_HH                                | 18.5                 | ~51±20%<br>(dep. on PRF and<br>satellite ground speed) | 64                             | North at image bottom<br>East-West reversed |
| <b>FBD</b><br>sar.Q16_64_HH/HV                             | 18.5                 | ~51±20%<br>(dep. on PRF and<br>satellite ground speed) | 64                             |   |
| <b>WB1</b><br>sar_Q16.dat_HH                               | 37                   | 70   | 12 (Near R.) to<br>20 (Far Rg) | North at image top<br>East-West reversed    |
| <b>WB2</b><br>sar_Q16.dat_HH                               | 18.5                 | 70   | 4NR -> 8FR                     |   |
| <b>Ground Range: GRD (GRS80 datum)</b>                     |                      |  |                                |   |
| <b>FBS</b><br>sar.Q16_64_g_range_HH                        | 50                   | ~51±20%<br>(dep. on PRF and<br>satellite ground speed) | 64                             | North at image bottom<br>East-West reversed |
| <b>FBD</b><br>sar.Q16_64_g_range_HH/HV                     | 50                   | ~51±20%<br>(dep. on PRF and<br>satellite ground speed) | 64                             |   |
| <b>WB1</b><br>sar_Q16_g_range_HH                           | 50 (100*)            | 70   | 12 (Near R.) to<br>20 (Far Rg) | North at image top<br>East-West reversed    |
| <b>WB2</b><br>sar_Q16_g_range_HH                           | 50 (100*)            | 70   | 4NR -> 8FR                     |   |
| <b>Orthorectified Ground Range: ORT-GEC (path product)</b> |                      |  |                                |   |
| <b>FBS</b><br>sar.Q16_64_ac_g_HH_path                      | 50                   | ~51±20%<br>(dep. on PRF and<br>satellite ground speed) | 64                             | North at image bottom<br>East-West reversed |
| <b>FBD</b><br>sar.Q16_64_ac_g_HH/HV_path                   | 50                   | ~51±20%<br>(dep. on PRF and<br>satellite ground speed) | 64                             |   |
| <b>WB1</b><br>sar_Q16_ac_g_HH_path                         | 50 (100*)            | 70   | 12 (Near R.) to<br>20 (Far Rg) | North at image top<br>East-West reversed    |
| <b>WB2</b><br>sar_Q16_ac_g_HH_path                         | 50 (100*)            | 70   | 4NR -> 8FR                     |   |

\* Azimuth pixel spacing is 100 m for ScanSAR GRD and ORT products processed up to June, 2007.

### **New ScanSAR pixel spacing**

The issue for improved pixel spacing better than 100 m for ScanSAR products was raised at an earlier science team meeting (by Maycira and Kevin) and as JAXA now has confirmed good radiometric quality of WB data, it was decided to provide strip products at finer resolution to the K&C Science Team. For WB data processed from August and onwards, the pixel spacing will be 50(rg) x 70(az) m for ground range and orthorectified products, as compared to 100 x 70 m before (see table). Pixels spacing for slant range data remains unchanged.

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## Mosaic pixel spacing

The non-square pixels only refer to the K&C strip products. The global PALSAR mosaics, both FB and ScanSAR, will be generated with 50 x 50 m pixel spacing.

## Modification of Orthorectified product

Requests for product level ORP-MER, Orthorectified Path image projected to Mercator projection, will be replaced by ORP-GEC, a non-projected version of the Orthorectified Path image where pixel and line directions correspond to range and azimuth. The reason for the deletion of the projected product is the very large image sizes associated with the rotation of the long strips.

## Geofactors

The file “geo\_factors”, which specifies gridded lat/long positions of the image data, will be generated also for ground range and orthorectified product levels. It was previously only provided for slant range data.

## Radiometry

### Far range fading

In order to maximise swath width, JAXA have so far included data beyond the standard 70 km, which in the far range part of the image has included a band with inconsistent radiometric quality. As the science team however found this to be more of a problem than added value, JAXA will in data processed henceforth reduce the image width to remove this part (approx. 900 and 450 pixels for FBS and FBD, resp.).

This affects PALSAR FBS, FBD and PLR data processed at both EORC and JAXA standard products.

## Calibration factor

Differences in the gain setting between FB and ScanSAR data will be corrected for in the upgrade of the SigmaSAR processor. Using a calibration factor (CF) of -83.0 dB,  $\sigma^0$  can be computed for all PALSAR products as follows:

$$\sigma^0 = 10 * \log_{10}(DN^2) + CF$$

## EOC (AUIG) standard products

### Error in Geo-coded Level 1.5

A geometrical error was discovered in PALSAR standard products from EOC. It concerns the **north-rotated “geo-coded”** option of Level 1.5 - ScanSAR, POL as well as FB modes - where a non-optimised resampling routine caused image distortions in the order of several pixels. Other product levels, including the level 1.5 “unspecified” (ground range) are not affected. The EOC processor was updated on May 21, and data processed after this date are not affected.

Those of you who ordered geo-coded level 1.5 products via AUIG before this date may request the concerned products to be re-processed. Contact the Order Desk.

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## **RSP number calculation**

You may have noticed that neither RSP or frame number are given in the summary files of PALSAR standard data from EOC, but instead a cryptic scene ID, type “ALPSRP059447190”, where the first 5 digits (05944) the orbit accumulation number, and the last 4 digits (7190) the frame number.

To convert from orbit accumulation number to RSP path number, use the formula  $RSP\ Path = [ 46 * \text{orbit accumulation No.} + 84 ] \text{ MOD } 671 + 1$ . You may also use the attached Excel calculator (OrbitAccumulationNo to RSP.xls), which has been made available by the Order Desk.

## Observation strategy

As a part of the observation strategy, polarimetric observations were undertaken during cycles 10 and 11 over regions covering about half the earth. The coverage is shown in the previous newsletter. The next pol\_inSAR campaign is planned for the spring of 2009 (cycles 26 & 27).

Given the good quality and rich thematic contents of the full pol data, and the interest the data have created within both K&C and by the science community in general, we have been looking into the possibility to undertake polarimetric observations over regions not covered by the Pol-InSAR campaigns. As major changes to the observation scenario cannot take place until after the first 3 years of operations have been completed, polarimetric observations have now been planned for cycle 15 (autumn 2007), as low priority background mission data takes. The objective is to create a full global coverage of polarimetric data (however still with gaps between passes below N60°).

Although not directly related to K&C, ScanSAR observations over Greenland have also been added on a twice per year basis as a low-priority background plan.

## Other K&C issues

### **The K&C Support Desk (ALOS-KC@jaxa.jp)**

JAXA EORC has established a K&C Support Desk - [ALOS-KC@jaxa.jp](mailto:ALOS-KC@jaxa.jp) - to which you can direct technical questions regarding for instance data processing, product dissemination, missing or faulty data, etc. Emails to the support desk are taken care of by Osamu Isoguchi, who re-directs your inquiries to the relevant person at EORC.

### **ALOS orbit order table tool**

For planning of field work activities in conjunction with ALOS acquisitions, many of you have asked for information about how to know what specific date ALOS passes over on a given RSP pass.

The attached Excel file “ALOS-orbit-order” contains look-up tables which list the RSP numbers verses passage date for cycles 1-30. Note that the tables have only been verified for a limited number of scenes up to cycle 11, however, so you may continue verifying the validity of the tables as new data become available.

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Keep in mind that the RSP number for a specific geographic location varies according to observation mode and orbit direction (ascending/descending), and in the case of ascending passes, whether the site of interest is located on the northern or southern hemisphere. Use the RSP maps distributed earlier for this purpose.

## **Product descriptions and work schedules**

As mentioned in the previous newsletter, Shimada-san has specifically asked for a concise status update from each Science Team member, for each of the products you are to generate (check your contract with JAXA): For those of you who didn't attend K&C#8, and who haven't yet submitted a status up-date by email (only 3 of you did...), please do so no later than **July 31st**. Provide me with a brief written report (as a Powerpoint presentation or as a Word document) with the following information:

Product name:

Description:

PALSAR mode:

Observation cycles;

Production schedule:

Estimated date of delivery:

Recall that final delivery of all products you are contracted to generate should be completed no later than January 2009, i.e. when your K&C agreements will expire.

## **A K&C Wiki site**

[By **Richard Lucas**] The University of Wales Aberystwyth (UWA) is now in a position to set up a wiki site using the Microsoft share point software. This site will allow K&C members to view, upload/download and modify documents/ online and will also allow enhanced communication facilities regarding K&C meetings and associated activities (e.g., conferences). There will also be a calendar and options for discussion groups although the site will not allow exchange of large datasets. We envisage a hierarchical structure; a K&C umbrella under which will sit the four themes - within these there will be sub-themes (e.g., mangroves, lakes). The site will be more flexible than the data base set up previously and will be editable by all members such that current information/thinking is always conveyed.

It is anticipated that the accounts will be set up before the end of August and the wiki site will be populated with a few documents (e.g., the newsletters) at this time. Further content will be requested in September and the site will go live at the end of September/first week of October.

Several K&C members completed an UWA Information Services (IS) registration form which is necessary in order to gain access. This form has been forwarded with this newsletter and so if you could download, sign and date and return to me [i.e. Richard Lucas] (if you have not already done so), I will arrange an account on the network. I will keep you updated over the next few weeks as to progress on the development of the wiki.

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## TerraSAR-X and K&C

We would here like to take the opportunity to congratulate our German colleagues from DLR for the successful launch of TerraSAR-X! The satellite, which carries a fine resolution polarimetric X-band SAR (9.65 GHz/3.1 cm), was launched with a Russian Dnepr-1 rocket from Baikonur in Kazakhstan on June 15, 2007. See [http://www.infoterra.de/tsx/lib/gloss/index.php#System\\_Parameters](http://www.infoterra.de/tsx/lib/gloss/index.php#System_Parameters) for more details.

As a joint activity between DLR and JAXA/K&C, DLR have generously offered to undertake TerraSAR-X acquisitions over a 10-15 K&C forest-, wetlands- and arid sites and make the data available to the K&C science team for joint L-band and X-band analysis. A complete list of the L/X-band sites will be given in the next issue of the K&C newsletter.

## Meetings and conferences

### **Next K&C meeting**

The next K&C Science Team meeting – **the K&C Mid-Term Meeting** - is tentatively planned for January/February, 2008, by which we hope that we all will have some interesting first results to present. The meeting will be organised either at JAXA Tsukuba Space Center again, or alternatively, at the RESTEC Headquarters in Roppongi, Tokyo. More information will follow.

### **ALOS PI Symposium**

Prior to the Science Team meeting, however, is the big **ALOS PI Symposium** which will be held in beautiful Kyoto on November 19 – 23, 2007. The symposium is directed towards researchers participating in the PI and AO programmes organised by JAXA and the ALOS Data Nodes and it expected to attract some 500 participants.

We are presently planning to organise a K&C special session at the symposium. It may either take the form of summary presentations by the Theme Coordinators, or perhaps feature presentations by individual science team members who will participate. More information will follow regarding this event as well.

### **K&C catch-up meeting**

A small K&C catch-up meeting will be held at EORC in Tsukuba on August 29-30, 2007, for three new members/collaborators representing the Brazilian Environmental Agency (IBAMA), the Ramsar Convention - via the International Water Management Institute (Sri Lanka), and WWF-Japan.

### **IGARSS 2007**

At the IGARSS meeting in Barcelona, there is a special session on ALOS. Tony Milne will be presenting talks relating to the forest and wetlands theme and so if you would like to send over any slides/illustrations which you would like to showcase, then please email to Richard Lucas ([rml@aber.ac.uk](mailto:rml@aber.ac.uk)) by the middle of next week.

### **Gamma course**

The Gamma course relating to ALOS PALSAR processing for K&C members and partners is provisionally scheduled for 17-21<sup>st</sup> September, 2007 in Bern, Switzerland, and is now fully booked. However, if you are still interested in attending, please could you contact Richard Lucas to discuss further.



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**Table 2: Event schedule**

| <b>Dates</b>                 | <b>Event</b>  | <b>Theme</b>     |
|------------------------------|---|------------------|
| Open                         | Titles/abstracts for Forest Theme topics  | F                |
| July 15 2007                 | Draft material/outline for Forest Theme Presentation at IGARSS.   | F                |
| July 23-27, 2007             | IGARSS'07, Barcelona, Spain<br><a href="http://www.igarss07.org/">http://www.igarss07.org/</a>  | All              |
| Aug. 29-30, 2007             | K&C catch-up meeting for IBAMA, Ramsar and WWF<br>JAXA EORC (Tsukuba)   | New members      |
| Sept. 10-17, 2007            | Int'l WS on Environmental Changes and Sustainable Development in Arid and Semi-arid Regions.<br>Inner Mongolia, China. (Philippe P. attending)<br><a href="http://www.iggcas.ac.cn/iw07/index.htm">http://www.iggcas.ac.cn/iw07/index.htm</a> | D                |
| Sept. 17-20, 2007 (TBC)      | SAR processing course at Gamma Remote Sensing, Bern, Switzerland  | All              |
| Sept. 25-28, 2007            | 5th Int'l Symposium on Retrieval of Bio- and Geophysical Parameters from SAR Data for Land Applications.<br>Bari, Italy<br><a href="http://www.congrex.nl/07c07/">http://www.congrex.nl/07c07/</a>  | All              |
| Oct 30-Nov 2, 2007           | Symposium on Radio Wave Propagation and Remote Sensing, Rio de Janeiro, Brazil. (Dalton in programme committee)<br><a href="http://wwwusers.rdc.puc-rio.br/ursif">http://wwwusers.rdc.puc-rio.br/ursif</a>                                    | FW               |
| TBD                          | Deadlines for proposing a special session at INTECOL (20-25 July 2008, Cuiaba, Brazil)<br><a href="http://www.intecol.pakmultimedia.com.br/">http://www.intecol.pakmultimedia.com.br/</a>   | W                |
| TBD                          | Deadline for proposing an AGU special session   |                  |
| Oct/Nov, 2007                | Deadline for proposing a special session at the Australasian Remote Sensing and Photogrammetry Conference (ARSPC)   |                  |
| Nov 12-14, 2007              | 2 <sup>nd</sup> Space for Hydrology Work shop. Geneva, Switzerland.<br><a href="http://www.congrex.nl/07m19/">http://www.congrex.nl/07m19/</a>  | W                |
| <b>Nov 19-23, 2007</b>       | <b>First Joint PI Symposium for ALOS Data Nodes and the ALOS Science Program</b><br><b>International Conference Center, Kyoto, Japan</b>  | <b>ALOS PI's</b> |
| December (TBD)               | AGU Meeting (10-14 Dec 2007, San Francisco)   |                  |
| January/February, 2008 (TBD) | K&C Mid-Term Science Team meeting. (JAXA Tsukuba, alt. RESTEC Tokyo – TBD), Japan   | All              |

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### Who is who?

As promised in the previous newsletter, we here provide you with a photo gallery with the JAXA and RESTEC people behind the scenes (and on stage!) who keep the K&C Initiative going. Thank you all!



We all know **Masanobu SHIMADA**, a.k.a. **Mr. ALOS**. As ALOS Science Project Manager, he is the one who has made this happen, who is formally responsible towards the JAXA management for all ALOS science activities, and who relies on us to deliver what we have signed up for (let's not make him disappointed!). Both JAXA and the international science community owe him great thanks for making both ALOS and JERS-1 accessible to the world. He is a great ambassador for JAXA and Japan!

**Mitsuyo KAKIMOTO** (JAXA) is the person always taking so good care of us at the meetings; making sure we get there and back by organising transports, hotels and all logistics. Kind, courteous and efficient, she is doing a great job to keep us happy!

**Takeo TADONO** (JAXA) runs the applications development for the PRISM and AVNIR-2 sensors, and leads the optical calibration and validation work. Always arriving early and leaving late, he is also in charge of the ALOS and K&C www sites.



**Kazuo OHTA** (JAXA) cares for the administrative aspects of the ALOS science activities, and is the one managing the financial account for meetings, travel support etc. A dedicated lover of wine, he also makes sure we can enjoy nice welcome receptions at every meeting!

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**Osamu ISOGUCHI** (JAXA) is back after a tenure at Tohoku University. Previously with RESTEC and working hard with the generation of the GRFM mosaics over SE-Asia, Isoguchi-san is now the person taking care of our inquiries to the new **K&C Support Desk** at [ALOS-KC@jaxa.jp](mailto:ALOS-KC@jaxa.jp).

**Kazuo ISONO** (RESTEC) is the leader of the RESTEC group at TKSC, which is established to provide technical support, man power and know-how to JAXA EORC. Spending some 5 hours commuting each day, Isono-san shows no signs of fatigue to make sure things run smoothly!



**Akira MUKAIDA** (RESTEC) is a well-know character to most of you in the science team. Despite working only part-time on ALOS (the other part on a JAXA lunar mission) Akira cares for the ASPERA and FTP data dissemination, for our accounts to the AGAP system, as well as the K&C image browser. Not exactly doing 8-hour working days, he often finds time to reply to his emails around midnight...

At the commands of Shimada-san, **Daisuke SANGO** and **Takahiro OTAKI** (RESTEC) crank the wheels of the SIGMASAR processor like oarsmen on a galley ship, generating the thousands of PALSAR strip data we so eagerly are waiting for. No land in sight for the next two years, their great processing task has just begun. *Gambatte kudasai!!!*

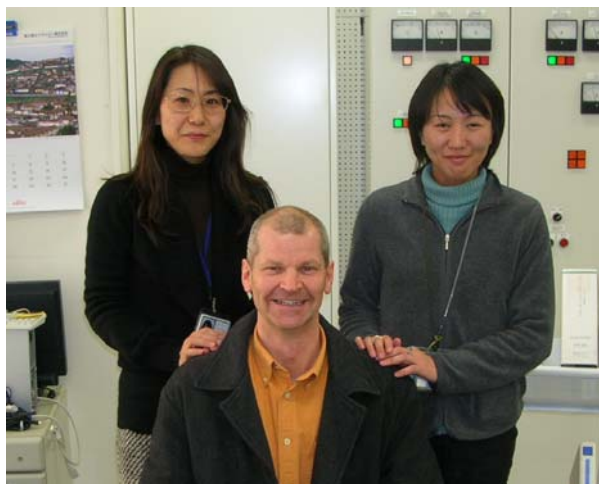


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**Emi AOKI** and **Fumi OHGUSHI** (RESTEC) manage the ALOS acquisition programming and make sure the systematic observation strategy is implemented as planned. To minimise the risk for missed acquisitions, they duplicate the K&C processing requests and submit them as additional acquisition requests prior to the start of every cycle. In case fill-in requests are needed, these ladies are in charge!

Although unfortunately no longer at JAXA, **Manabu WATANABE** must nonetheless be mentioned as one of the most important persons to make ALOS become an operational satellite. Extremely dedicated and hardworking, he made the ALOS systematic observation strategy become reality. Presently assistant professor at Tohoku University, we wish Watanabe-san good luck to pursue his own research interests and hope that he will remain active also within the K&C.



Always so kind and efficient, **Kayako IWASA** and **Satono MEGURO** (RESTEC) are the ladies behind the **ORDER DESK**. Here posing with a happy K&C official (^\_^), they are in charge of the AUIG and our requests for ALOS and JERS-1 standard products from EOC. It is always a pleasure to contact them!

### Summer opening hours

Please get back to me with any comments and questions you may have to the issues covered (or missed out) in the newsletter. As I will be on vacation between July 23 and August 10, and on travel August 20-31, please CC your messages to my alternate email [ake\\_ros@yahoo.co.uk](mailto:ake_ros@yahoo.co.uk). The shop is open sporadically...

Hibya Summer Greetings,  
Ake

*Ispra, July 18, 2007*