TPM Meeting #02 – November 2016
Minutes of Meeting

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AMENDMENT RECORD SHEET

The Amendment Record Sheet below records the history and issue status of this document.

ISSUE	DATE	REASON
0.1	15 Nov 2016	First draft issue for internal review
0.2	22 Nov 2016	Second draft issue incorporating internal feedback
1.0	25 Nov 2016	Third draft issue for ESA review

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1. INTRODUCTION

This document details the minutes of the TPM Meeting held at ESRIN on 10th November 2016. This meeting was intended to be a TPM Coordination Meeting focussing on the activities which are on-going within IDEAS+ for all the TPMs and upcoming opportunities.

1.1 Agenda

9:30 - 9:40	Introduction
	o Scope and Objectives of the Meeting
9:40 - 10:20	ALOS Optical
	o Optical IPF Status o Pilot Processing QC Results o *DSI Status on ALOS Optical Reprocessing*
10:20 – 10:40	ALOS PALSAR
	o PALSAR Processing OTF (GMV)
10:40 - 11:30	Landsat 1-7
	o MSS IPF Update o TM/ETM Status o *DSI Status*
11:30 - 12:10	Landsat-8
	o L8 Performance Results o Proposed L8 QC Evolutions
12:10 – 12:20	OceanSat-2
	o QC Activity status
12:20 - 12:30	MOS-1
	o MOS IPF Status o MOS QC Results
12:30 - 12:40	JERS-1
	o JERS-1 IPF Status o JERS-1 QC Results
12:40 - 13:00	Conclusions & Lessons Learnt AOB

1.2 Attendees

The following participants were present for this meeting:

Name		Organisation	Role
Angelika Dehn	(AD)	ESA	IDEAS+ Technical Officer
Roberto Biasutti	(RB)	ESA	TPM Operations Manager
Ferran Gascon	(FG)	ESA	IDEAS+ Technical Officer for Optical TPMs
Bruno Schmitt	(BS)	ESA	TPM Operations Support
Paolo Boezi	(PB)	Rhea	DSI Project
John Swinton	(JS)	Telespazio VEGA	IDEAS+ Service Manager
Amy Northrop	(AN)	Telespazio VEGA	Landsat Task 1 Team
Sébastien Saunier	(SS)	Telespazio VEGA	ALOS & Landsat Task 1 Team

Sam Lavender	(SL)	Telespazio VEGA	Landsat, OCM & MOS Task 1 Team
Massimo Cardaci	(MC)	Serco	IDEAS+ Task 2 Coordinator
Marco Meloni	(MM)	Serco	DSI Project Team

2. MINUTES OF MEETING

JS presented the overall objectives of the meeting; to review the status of all ongoing IDEAS+ activities for each of the ESA TPM missions (LS1-8, ALOS, OceanSat-2, MOS and JERS-1), discuss any open points and take decisions where needed as well as to present and discuss Risks, Issues and Lessons Learnt to apply to future reprocessing projects.

2.1 ALOS – Optical

MC provided a status overview of the ALOS Optical IPF and the open issues were discussed. Firstly, there has been a request from GMV to support an issue detected with anomalous L0 where the processor fails. The cause has been attributed to either corrupt CSV files or CSV files that are too small. There are no outstanding issues for the L1B processor.

An issue with the L1C processor was discussed whereby the IPF finishes processing an input file with an exit code but does not produce any L1C products. The first stage is to confirm that the issue is with the IPF and not with the data or orchestration by assessing the Job Order and attempting to reproduce and understand the issues before contacting DLR (FUP contract).

RB was keen to understand the reprocessing schedule for ALOS Optical. The plan was discussed and it was agreed to first assess / resolve the “exit code” error of the L1C processor, and the orthorectification issues in the L1C and then proceed.

Regarding ALOS Optical quality control, pilot processing data has been investigated and SS presented the approach and the results. The following quality topics were addressed:

- Quality statistics for the overall archive
- Data format and data packaging
- ESA / JAXA comparison
- L1B1 / L1C image quality
- L1C geometric accuracy

Quality statistics for the overall archive: With harvesting of L0 IV file, L1B and L1C, a dedicated QC catalogue has been created. It supports production of statistics for better characterizing / describing the archive, and it also supports validation by implementing a stratification strategy for data sample selection. The distribution of the ALOS pilot processing products was presented and it was noted that some of the data is out of zone (over the USA). The conclusion was that these must be from JAXA data. RB also noted that as part of the pilot data, there was no PRISM data coverage over the desert. SS mentioned that gain setting applied to AVNIR-2 data is sometimes not appropriate, and consequently, a lot of images are fully saturated and the data cannot be recovered. The chosen approach is to give the affected products a low quality value and leave AMALFI to detect the saturation.

SS has spent time investigating the differences between L1B1 frame location and frame location as specified in the IV file. For some products, a shift of approximately 2.5 seconds is observed, possibly due to the accuracy of orbit files; IV file is generated with predicted data whilst 1B1 is mostly generated by using consolidated data.

Data format and data packaging: A bug has been detected in the packager most likely due to the orchestrator (ZIP SIP filename does not match with the product reference inside). The geometric quality was badly reported in the MTL, the approach has been reviewed and updated by DLR, as for scene statistics.

ESA / JAXA Comparison: A new comparison has been made between DSI and JAXA 1B1 products, the results are correct.

L1B1 / L1C Image quality: On AVNIR-2 image, the staggered alignment of the detector makes mis-registration visible at the upper and lower part of the band composition image; the image channel is badly cut as for Landsat TM bumper mode image (scene left / right border). It was discussed whether to apply a blanket cut to the products or leave it as is. As the problem is considered minor, the decision is to leave as is so as not to alter the product content.

L1C Geometric accuracy: Availability of the catalogue (see above) allows to select scenes that have never been investigated to date. SS showed some strange geometric effects for scenes observed in the southern hemisphere, namely the Namibia scene. DLR has confirmed the issue and explained that it was not due to the reference data. Affected scenes are located at the end of a very long ALOS orbit therefore investigations are on-going.

In addition, regarding PRISM, the strongly varying geometric accuracy between NADIR and FORWARD / BACKWARD views depending on the terrain content and terrain relief (parallax effect not totally corrected), was discussed during the meeting. It was discussed whether to release only the FORWARD / BACKWARD image where the nadir product is not available, however, SS noted (post-meeting) that it is not possible to identify such products so all three views should be delivered to the users, in particular for moving target analysis. Regardless of the approach, information on mis-registration must be added to the user note.

SS mentioned that he had found an ALOS paper issued on October 2010 (ESA Funding): S*. Saunier, P. Goryl, G. Chander, M. Bouvet, R. Santer and S. Kocaman, "Radiometric, Geometric and Image Quality Assessment of the ALOS AVNIR-2 and PRISM Sensors", IEEE Transactions on Geoscience and Remote Sensing, vol.48, no 10, pp. 3855-3866* which proposes a quality status of the ALOS PRISM / AVNIR-2 mission. It was suggested to share this with users through the ESA SPPA web portal as it forms a good baseline for validation purposes (reference values).

SS explained that by using the three PRISM view images, JAXA has been pleased to announce the release of a world PRISM Digital Elevation Model, http://www.eorc.jaxa.jp/ALOS/en/aw3d/index_e.htm. The planimetric accuracy of this product is 30 m resolution, to be compared with the native 2.5 m resolution of the input PRISM data (Very High Resolution Data).

2.1.1 DSI ALOS Status

MM reported the ALOS collection as being in good shape, and of the 2,500 segments still to be processed it is expected to recover ~500 of these. BS is in contact with JAXA regarding this.

The consolidation results were presented and it was noted that the number of 'Deliver archive product number (showing overl.)' is higher than the master catalog numbers due to nested products and overlaps.

33 L0 cannot be processed at all ("all scenes are in error") which has an impact on the L1C processing. Note: The AMALFI version used for the L1B and L1C QC is the same.

The green light given to start the processing is now on hold until after the orchestration issue investigation. L1B and L1C processing is expected to take 3 months to complete.

2.1.2 Summary of Decisions Taken

- Address the orchestration and "exit code" issues first, followed by the orthorectification issue.
- Make all NADIR / FORWARD / BACKWARD PRISM data available to the users, as long as information on mis-registration is made clear to the users.
- Make the ALOS paper (2010) available to the users on the ESA SPPA webpages.
- Leave the cutting of L1C products as is.

2.2 ALOS – PALSAR

MC explained that the latest version (v4.16_p7) of the PALSAR IPF has been integrated in OTF and that GMV have successfully completed the conversion of all the raw L0.

The pilot study is a substantial subset and QC checks will be performed over the calibration sites prior to reopening OTF data to the users. The pilot study is split into two phases:

- Phase 1: preliminary go-ahead recommendation, based on approximately 500 products
- Phase 2: completion of recommendation and of the remaining deliverables, by Q1/2017

2.3 Landsat 1-7

RB began the discussion by presenting the number of registered ESA users for Landsat data (450) and the number of downloaded ESA Landsat products to date (>191,000).

AN presented each of the MSS IPF updates, including the reason for the update and an overview of the specification for each.

Management of the L1-introduced saturation was discussed in detail and it was agreed that the coefficient change should be applied over the sea to avoid a step effect. It was noted that significant testing needs to be done for this update.

The combination of bands to use in the new full resolution QuickLooks (QL) was discussed. The current combination for MSS (ESA and USGS) is 3-2-1, however it was agreed to produce some sample 4-2-1 products to decide the best approach. It is thought that the latter combination would provide less saturated QLs as Band 4 is rarely saturated.

The quality assurance band (BQA) was presented and the possibility of producing an 8-bit gif BQA QL was considered. The ESA dissemination server can provide a link to this QL if it is produced and will be a value-added product. However it was noted that this update may have an impact on schedule and should be assessed before proceeding.

FG asked about the cause of sticky bit, and SS explained that this is due to either bad transcription from tape to SONY D1 media, or the poor thermal control of the tape room.

The latest MSS IPF schedule was presented, including all the IPF and AMALFI development, integration and testing activities. The delay of 11 weeks to the final delivery, caused due to external factors related to the TDS provision, was highlighted. It was agreed to try and absorb some of the delay by integrating the IPF at the IDEAS+ environment alongside AMALFI development. It was also suggested by RB that once fully integrated and processing has begun, that QC efforts should focus first on the OK dataset so that a subset can be released to the users as soon as possible.

The latest TM / ETM+ status was given and similarly to the suggested approach above for the MSS QC, the need to begin QC of the OK Matera delta TM / ETM+ datasets was highlighted by RB, recognising the need to raise the priority of this activity in the whole chain (IDEAS+ and DSI) from it's current 'lower priority' status. AN confirmed that this activity can begin as soon as all TDS (for verification of the developed IPF) have been defined by IDEAS+ and the approach to provide them has been agreed with DSI / ESA. Definition of the TDS is considered a higher priority activity given the previous issues and the need to absorb delays.

AN presented the compatibility of the MSS IPF updates for TM /E TM+ products and one approach for Scan Line Anomalies (SLA) in the BQA would be to apply the fourth bit to band 7, rather than band 4. This discussion would continue at the time of IPF tailoring for TM / ETM+, should it occur in the future.

RB mentioned that some Landsat 7 ETM+ products still remain in the Fucino archives (including from other ground stations i.e. Kenya). Transcription of these may still be possible but is not guaranteed. No timeframe was presented by ESA for this activity. RB also noted that it is not known where the Landsat 4 TM L0 products are.

2.3.1 DSI Landsat 1-7 Status

MM gave the latest update on the Landsat 1-7 main activities for DSI including the total number (OK and NOK) of processed Matera Delta products, and the status of the State Vector regeneration activities.

During presentation of the Matera Delta coverage density maps, RB and BS noted that some products remain unprocessed over the equator, although this seems to have improved since the patch delivery. This will be need monitoring during the QC.

2.3.2 Summary of Decisions Taken

- Assess the possibility of using band combination 4-2-1 for MSS QLs.
- Assess the possibility (time and budget) of producing .gif BQA QLs (including producing an example for analysis).
- Try and absorb the IPF delay by integrating the IPF at the IDEAS+ environment, alongside AMALFI development.
- Begin QC of Matera Delta as soon as possible (focusing first on OK datasets).

2.4 Landsat 8

SS presented the status of the Landsat 8 IDEAS+ activities and gave an overview of the current monthly performance analyses. SS noted that some of the early ESA products appeared unavailable on the ESA Landsat 8 Web Portal, however RB explained that the cause might be due to Matera and Kiruna data only being available after December 2013 (for Libya-4 coverage). If this is not the case, and data is missing, this would be a major issue for ESA so it was agreed to check the data availability as soon as possible.

SS mentioned a problem with accessing L8 data using SSO accounts. RB acknowledged that this was a known issue and suggested opening a ticket to EOHelp requesting machine-to-machine access.

The location and distribution of the L8 geometric test sites were presented by SS who noted that the Saragossa site has been discarded due to it being too cloudy, most likely due to the mountainous location. Despite this, it was suggested by RB to include a more mountainous geometric test site. SS noted that the Peimont site, equipped with absolute geometric reference, covers this request.

SS stressed the importance of adopting a more collaborative approach for the reporting on Landsat 8 radiometric calibration, both with the USGS and CGI (IPF developers). FG agreed to send the latest MPC report to SS immediately.

As a side note, FG explained that the Global Reference Image of Sentinel-2 will be used by the USGS for LS08.

2.4.1 Decisions Taken

- Assess the availability of L8 data during commissioning and early operational phase as soon as possible.

2.5 OceanSat-2

SL first presented an overview of the work conducted by Brockmann Consult on the Level 2 OCM-2 product quality and went on to explain the quarterly report status. A python script has been developed to semi-automate the quality assessment process.

It was noted that the L2 Bottom of Atmosphere (BOA) radiances are not in the L2 products, despite being calculated during the processing.

SL also highlighted that the users will require support and/or more information about the projection of the OCM-2 data as it is not possible to import this into software (such as QGIS) in its current format.

2.6 MOS-1

MC reported the activities required to create a reference system for MOS, given the (now) incompatibility of the latest TPM SW with MOS older version (common part). RB highlighted the possibility that in the future a new MOS processor could be needed. RB explained in fact that next year reprocessing of the MOS data will occur if the correct funding is allocated and this would result in a completely new IPF.

SL gave a summary of the MOS-1 activities and a progress update regarding verification of the processor to handle MOS products generated with different versions of the transcription software. Initial results indicate that where the data processing completed, the output was successfully generated, however the format is not compliant with the SAFE specification.

SL also mentioned that the GAEL MOS quality control report highlighted that the indicated VTIR data format was different to that of the products, and they'd been unable to read the VTIR data successfully. Further work has discovered that at least one of the VTIR bands is stored in six strips, and something similar to the provided QuickLook has been created but further work is needed to fully discover the format.

AD questioned the demand for MOS data, and RB stressed the importance of the reprocessing as it was such an early mission and similar data is not currently available.

2.7 JERS-1

MC gave an overview of the JERS-1 SAR IPF and stated that although the reprocessing (using 2.05_p2) was paused due to infrastructure issues, this is now expected to finish in the next week or so.

During presentation of the QC status, the discrepancy of the start / stop time reported in the metadata and filename of the L0 causing errors in production of higher level data was discussed. At this stage it was also mentioned that 2.06_p1 should include corrections for all known issues, including this start / stop problem, MC was to confirm this to ESA.

Post meeting note: the investigation on the start/stop problem highlighted the fact that there is the need to clarify the specification to follow, to avoid unilateral implementations. Actions in this sense have already begun, involving S. Folco.

So the issue is not closed, but specification is being defined. It will be part of the eventual new IPF version, to be delivered once QC is complete (see also below the three envisaged scenarios).

MC also recalled that once the reprocessing is completed and the QC performed, there will emerge an eventual recommendation for what to do with the already existing new processor:

a) Whether to further improve it with the inputs emerging from the QC;
b) Whether to use it as-is;
c) Whether not to use it at all and consider the results of the current reprocessing satisfactory (this decision is probably making sense only because of absence of funds).

2.8 Risk Register & Lessons Learnt

MC presented the risk register. The discussion included the impact on the consolidation of the Landsat MSS IPF baselines by trying to incorporate too many improvements; the complexity of the validation activities for the Landsat MSS IPF and how this may cause a shift in the overall planning; and that the very strict ALOS PALSAR QC timeline may reduce phase-1 completeness.

Various issues that had been mentioned throughout the meeting were summarised at this point: direct access to the L0 Landsat MSS data is not yet available and the current method of provision is not effective and has had an impact on the IPF development schedule. In addition, it was highlighted that there are limitations with the usability of TPM data when there is insufficient documentation (namely for MOS and OceanSat-2).

2.9 Conclusions

RB mentioned that some support from IDEAS+ would be needed at the upcoming Landsat Ground Station Quality Working Group Meeting. This meeting is planned to be held in Gabon in early December with both ESA and USGS present. RB requested a presentation from IDEAS+ summarising the evolutions included in the MSS IPF v3.05. AN will prepare these slides in cooperation with SS and SL.

RB closed the meeting by saying that most TPM activities will now fall under the LTDP contract apart from ALOS and Landsat, which will continue to be led by RB under IDEAS+ until the end of the project.

2.10 Actions

Action #	Action Description	Due Date	Actionee / Status
TPM Meeting #1 – 25/11/2015			
#01	RM to send updated Reprocessing Plan, with additional comments from SS, to MM for review and feedback	27/11/2015	RM / Closed
#02	MM to provide feedback and comments on the IDEAS+ ALOS Reprocessing Plan	11/12/2015	MM / Superseded (pilot was to be conducted prior to verifying the plan. Plan may

			be updated following investigation of open issues)
#03	AN to prepare presentation for Landsat Working Group Meeting	08/12/2015	AN / Closed
TPM Meeting #2 – 10/11/2016			
#04	IDEAS+ to make ALOS paper available via ESA SPPA webpages	30/11/2016	SS / Open
#05	AN to liaise with ACS regarding the band combination to be used for the new MSS products, and present the results to ESA for confirmation	30/11/2016	AN / Open
#06	AN to liaise with ACS regarding the possibility of the MSS IPF producing an 8-bit gif BQA QL, and present the results to ESA for consideration. The impact on schedule and cost shall also be presented.	30/11/2016	AN / Open
#07	IDEAS+ to present a new schedule to ESA for the complete phase of MSS IPF and AMALFI development, testing and integration.	30/11/2016	AN / Open
#08	SS to check the availability of Landsat 8 data over Libya-4 during 2013 on the ESA Web Portal and confirm / deny their presence to RB and FG.	30/11/2016	SS / Open
#09	SS to send to RB a list of the desired Landsat 8 reports and documentation	30/11/2016	SS / Open
#10	FG to send the Landsat 8 MPC report to SS	10/11/2016	FG / Closed
#11	MC to check whether JERS IPF 2.06_p1 incudes the correction for the start/stop issue.	30/11/2016	MC / Closed – see section 2.7
#12	AN to prepare slides to be presented at the Landsat Ground Station Quality Working Group in cooperation with SS and SL.	25/11/2016	AN / Open