

Minutes of Meeting

Meeting Name : IRSMAG May 2018 minutes
Meeting Reference : EUM/RSP/MIN/18/997984, v1
Meeting Date : 24-25 May 2018
Meeting Location : EUMETSAT
Minuted by : Dorothee Coppens/Bertrand Theodore
Participants : See table below
Distribution : Participants + Mateja Irzic-Zibert + Erik Gregow
Attachments : *None*

List of participants:

| Name | Institute |
|-------------------------------------|------------------|
| MAG co-chairs | |
| Herve Roquet | Météo-France |
| Bojan Bojkov | EUMETSAT |
| MAG secretary | |
| Dorothee Coppens | EUMETSAT |
| MAG members | |
| Nigel Atkinson | MetOffice - UK |
| Claude Camy-Peyret | IPSL |
| Pierre-François Coheur | ULB |
| Nadia Fourrie (partially) | Météo-France |
| Antonia Gambacorta | NOAA/NESDIS/STAR |
| Christina Koepken-Watts | DWD |
| Miguel A. Martinez | AEMET |
| Tony McNally | ECMWF |
| Johannes Orphal | KIT |
| Dave Tobin | CIMSS |
| Internals + ESA representers | |
| Tobias Guggenmoser | ESA |
| Thomas August | EUMETSAT |
| Gary Fowler (partially) | EUMETSAT |
| Stefano Gigli (partially) | EUMETSAT |
| Jochen Grandell | EUMETSAT |
| Chris Hartley (partially) | EUMETSAT |
| Tim Hultberg | EUMETSAT |
| Rory Hutson | EUMETSAT |
| Dieter Klaes | EUMETSAT |
| Bertrand Theodore | EUMETSAT |

[Introduction - co-chairs](#)

Introduction of the meeting and presentation of Chris Hartley (MTG system manager).

[On-going actions – co-chairs](#)

| Id | Description | Comments |
|---------------|---|---|
| Action M3.A.1 | The secretariat to liaise with Met Office to further clarify the details of the calibration data | Action on N. Atkinson and Gary Fowler to gather the information and send the notes to MAG secretariat. Closed. |
| Action M3 A.4 | The Secretariat to liaise with ESA to explore the potential of making planned measurements with MTG-IRS breadboard available | Gary notes that before asking ESA, we should come with a list of what would be needed Claude mentions that in particular data on the blackbody and the lasers (noise, stability...) will be useful for the users. Johannes adds that a NDA can be signed if some of these information are sensitive. Closed. New action on Johannes Orphal, Dave Tobin, and Claude Camy-Peyret to prepare a list of what parameters are needed. |
| Action M3 A.6 | EUMETSAT Secretariat to liaise with CMA regarding the availability of documentation describing the GIIRS instrument, and further explore availability of observations after a successful launch and Cal/Val | This action was revised as “give a feedback from the visit at CMA by email when back”. Feedback provided during the current meeting: closed |
| Action M4 A.1 | To test the effect of a stronger apodisation on their side and see by when this can be done. | No feedback received apart from the work of Nigel. Pierre Coheur mentioned that he has performed some tests and that the differences between strong and weak apodisation are almost undiscernible. More discussion on the apodisation during the meeting. Closed. |
| Action M4 A.2 | To provide feedback on missing meta data in L1 products | No feedback received. This action is closely linked to the availability of test data; however, the dataset released a couple of years ago is not representative of what is currently in the Product Format Description. Closed. New action to circulate the IRS level 1 PFS to MAG members (new version coming by summer 2018) along with a test dataset by next Autumn. |
| Action M4 A.3 | To check if the CD information and the SRF shape error index are part of the L1 products | Corner cube direction (CD) is part of the L1 products. Dorothee suggests to replace the SRF shape error by a quality indicator of the uniformisation process. This was accepted. Closed. |

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| Action M4 A.4 | To check pixel ordering within dwells in L0 and L1 products files | <p>Gary explains that the pixel (1,1) should always be the southwesternmost but this is still open. The decision will be taken in summer 2018 and will be explicitly documented in the IRS level 1 PFS.</p> <p>Claude expresses the need to have the geolocation of the four corners of each pixel or alternatively to have the information to compute them as well as the Earth shape model used for the navigation. This will be described in the product user manual even if, as mentioned by Tobias, the actual shape of the pixel is not necessarily a quadrangle since sub-pixels can be de-selected.</p> <p>Closed</p> |
| Action M4 A.5 | To give information on the duration expected for the outage, on top of the 64 minutes of the yaw flip manoeuvre | <p>Stefano indicates that, even if the spacecraft manoeuvre itself is not very long, However, the INR software (i.e. the navigation) will require “some time” to catch up. The measurements acquired during this period will be tagged by a dedicated flag. Value to be specified by next MAG (Autumn 2018); open.</p> |
| Action M4 A.6 | To investigate and communicate on the provision of geolocation information (lat/lon per band) to the users | <p>(lat,lon) will be provided in the product files for one band + information (translation, rotation...) to retrieve the geolocation of the second band.</p> <p>This answers the action as it was minuted during MAG4. However, it appeared necessary to have more information on the accuracy of the geolocation. Closed. New action: EUMETSAT to provide more information on geolocation accuracy by next MAG (Autumn 2018)</p> |
| Action M4 A.7 | To circulate last’s year presentation related to the previous Action M4 A.3 | <p>Done.</p> <p>Closed.</p> |
| Action M4 A.8 | To consider the dissemination of the imager mode data to the users and give feedback to the MAG | <p>Rory explained that this is not yet considered by EUMETSAT as image dissemination is not fully justified. The MAG members however unanimously reply that users need a measure of the scene heterogeneity, whatever it is (it could also be a mean value and standard deviation on the scenes).</p> <p>Open.</p> |
| Action M4 A.9 | EUM to give information on a consolidated strategy to capture with PCs rare and special events by next MAG | <p>Closed: will be presented at the meeting.</p> |
| Action M4 A.10 | MAG members to send more ideas that could be implemented in IRS PP by emails to Nigel. | <p>Feedbacks received from ITWG (International TOVS Working Group) in December 2017.</p> <p>Closed. New action on Nigel to circulate the draft processing specification of the</p> |

| | | |
|----------------|---|---|
| | | IRS-PP. |
| Action M4 A.11 | To provide EUMETSAT with available information at ECMWF on the quality of radio-soundings | Open. Tony McNally indicates that he will fulfil the action by next MAG. |
| Action M4 A.12 | Linked to the recommendation Recom.M4.R5 , to present the results from the comparisons between the L2VDP and radio-soundings | Open , postponed to next MAG. |
| Action M4 A.13 | MAG members to give comments on the measurement sequence, to be presented at the next MAG meeting. | Closed. Gary indicates that any scenario alternative to the current baseline could be tested during the commissioning and could then become the operational baseline. MAG recommends the new sequence: 3x(LAC4,LAC3), 3x(LAC4,LAC2), 3x(LAC4,LAC3), 3x(LAC4,LAC1)) as the operational one. |
| Action M4 A.14 | To circulate the documentation on the latest emissivity maps mentioned by Miguel | Closed. |
| Action M4 A.15 | To give feedback to Secretariat about their needs in terms of IRS test data. | Christina and Tony have presented input during MAG3 in Ljubljana, otherwise not much feedback received. Closed. New action on EUMETSAT to circulate the slides and on MAG members to comment and provide feedbacks. |
| Action M4 A.16 | To create a MTG IRS MAG e-mail list mimag@eumetsat.int | The following email address has been created: 1_irmsmag@listserv.eumetsat.int . Closed. |

[Report on open issues discussion from former MIST/MIMAG group – Christina Köpken-Watts \(DWD\)](#)

Summary

Based on the 36th STG-SWG presentation, March 2014. It addresses:

- Data compression
- Assimilation of PCs
- Assimilation of L2 products
- AMVs
- Atmospheric chemistry
- NWC

With a list of recommendations.

Discussion:

Comment from Tony McNally: It is important to keep the points that are still currently relevant.

- ⇒ Answer: review the list of actions/recommendations, close/dismiss those that are not relevant anymore and come with an updated list by the end of the meeting.
- ⇒ Remaining items will be merged with the rest of the currently opened actions/recommendations.

[IRS instrument performances – Tobias Guggenmoser \(ESA\)](#)

Summary:

Tobias is showing the NedT – radiometric performance, SRF accuracy, pointing performances, straylight performances. Non-compliance in band 1 (0.13K instead of 0.1K). Long term radiometry stability is compliant (i.e. within 0.3K).

Discussion:

- It is not clear to the group how the presented results were obtained, industry being quite reluctant to publish details on the measurements. The group expresses the desire to have access to this kind of details.
- A subject of concern arose: the integrated energy in the pixel that is of the order of 50% in the 4x4km², 92% within 12x12km².
- The co-registration between bands is non-compliant and now estimated to 1100m E/W and 1000m N/S (requirement was 800m).

[Presentation of a consolidated strategy to capture rare and special events \(additional local PC or provision of residuals\) – Tim Hultberg \(EUMETSAT\)](#)

Summary

- This presentation is an answer to the action M4 A.9: “EUM to give information on a consolidated strategy to capture with PCs rare and special events”
- Reminder on the hybrid PCs strategy: distribution of n local PCs and their scores in addition to the global static PCs
- Experiments on 4 case studies are presented to validate the number of local PCs: in 2 cases (volcanic eruptions) 5 local PCs allow to completely capture the atmospheric signal. In the case of the wildfires in Russia in 2010, the hybrid approach does not fully capture the signal.
- Two approaches possible: conventional hybrid and twisted hybrid PCs. The conventional approaches being more robust.
- The local PCs are good to capture the trends at 923 cm⁻¹ (CFC-12) and at 948 cm⁻¹ (SF₆).
- Moderate increase of 0.6% of the IRS L1 products size (including eigenvectors).

Discussion:

Question from Pierre Coheur: What about the availability of the residuals? Would it be possible to have the outliers? This would be needed almost in NRT.

⇒ Answer: for the moment only a flag indicating that the residuals are out-of-limit is foreseen.

Question from Tony McNally: Any delay because of the additional processing?

⇒ Answer: There will be no delay.

Comments from Tony McNally: there is a concern that the eigenvectors change too frequently or at least in an uncoordinated manner. Any update of the eigenvectors needs to be communicated to the users well in advance.

⇒ A recommendation has been taken (M5.R2).

Question from Dave Tobin: how good the calibration needs to be for the PCs?

⇒ Answer: there is no requirements on the quality of the calibration; one can even anticipate that this will help the calibration as some PCs will retain instrument features (e.g. undetected spikes) while others capture the science signal. The former could or could not be used by the users.

Recommendation:

RecomM5.R1: the group strongly supports the hybrid PC approach i.e. global PCs on a stable (fixed) basis + 5 local PCs to capture possible outliers.

Recom.M5.R2: During operations, if the basis vectors of the global PCs have to be updated, the group recommends that this is done in a coordinated manner and in particular that the users are warned well in advance

Recom.M5.R3: To make the PC residuals for outliers available offline. For observations with poor reconstruction scores, likely associated with exceptional local events, full L1 products should be made available offline if possible.

Action:

Action.M5.A1: to include hybrid PC approach in the L1 ATBD and PS and to update EURD (by end of June) accordingly.

[On the reversibility of MTG-IRS apodisation conversions – Nigel Atkinson \(Met Office UK\)](#)

Summary:

- This presentation is an answer to the action M4.A.1: “test the effect of a strong apodisation”; it addresses the question: is the apodisation/de-apodisation accurate and reversible ?
- Experiments performed over band 1 (680-1210 cm⁻¹) using IASI as a proxy but with a spectral sampling of 0.625 cm⁻¹.
- Results with light apodisation show some “noise” at band edges but one order of magnitude below the noise specification: this suggests that apodisation can be reversible provided that the function does not fall to 0 in the spectral domain.
- Results when applying heavy apodisation (Hamming) exhibit much higher error at band edges: in that case, some margins (20 cm⁻¹ is suggested) would be needed

Discussion on the need of having a strong apodisation in the operational processing:

- Dave Tobin wonders why reversibility is important; Nigel Atkinson answers that ensuring reversibility would allow users to remove the possible strong operational apodisation (that would be applied at the end of the processing, clarifies Dorothee Coppens).
- However, some members of the group (Pierre Coheur, Claude Camy-Peyret) question the interest of distributing strongly apodised spectra; they would prefer lightly apodised ones.

- Bojan Bojkov remarks that, as light apodisation seems to satisfy most of the users, the question is then: should we distribute spectral margins to leave the possibility for those who want it to apply another apodisation function.
- Tony McNally states that ECMWF would be happy to sacrifice the few channels at band edges lost when applying a strong apodisation function. There is no strong feeling to disrupt the baseline of the IRSL1PS and to distribute spectra with spectral margins.
- All agree then to have the possibility of applying the strong apodisation, namely the Hamming apodisation as used in the CrIS processing, in the IRS-PP and let the users know on how many points at the band edges (3 maximum) there will be an increase of the noise due to the absence of spectral margins.

Recommendation:

Recom.M5.R4: EUMETSAT to keep the light apodisation as described in the baseline in the operational IRS level 1 processing and to distribute spectra without spectral margins. A strong apodisation (Hamming on 3 points as it minimizes the number of “degraded” channels) will be proposed as an option in the IRS-PP.

[Analysis of the detector responsivity correction method presented by UW at ITSC-21 – application to MTG-IRS – Nigel Atkinson \(Met Office UK\)](#)

Summary:

An uniformisation procedure that differs mathematically from what is in the IRSL1PS baseline was presented by Hank Revercomb at ITSC-21. Nigel has performed experiments using this method on simulated IRS lightly apodised spectra. Results show a significant improvement in some spectral regions, giving similar performances as the IRS L1 processing baseline. Nigel concludes that this method and the EUMETSAT one should be compared with the same radiometric response to close the loop.

Action:

Action.M5.A2: Nigel and Dorothee to compare the performances of each uniformisation method (this includes exchanging the radiometric response functions) by next MAG (Autumn 2018)

[Short communication on GIIRS L0/L1 data – Dave Tobin \(CIMSS\)](#)

Summary:

- UW-SSEC has received some data from CMA:
 - 2.5 hours of preliminary FY-4A GIIRS L1b data: large artefacts
 - Then the corresponding L0
- A software has been developed to calibrate the L0 using sometimes ad-hoc hypotheses to compensate for the lack of information.
- Qualitative comparison with CrIS shows promising results

[IRS Level-1 Format Specification feedback – Rory Hutson \(EUMETSAT\)](#)

Summary:

The presentation is about open issues regarding the Spectra Radiance Scaling, image mode, calibration dataset, going through the feedbacks from Miguel Martinez.

Discussion:

No discussion as most of the topic have been discussed on day 1.

[Limb measurements from satellite: possible combination and synergy with MTG-IRS – Claude Camy-Peyret \(IPSL - UPMC/UVSQ\)](#)

Summary

Overview of some past, current and future limb-sounding instruments: MLS, ALTIUS, AtmoSAT, Gloria, ACE as well as how and where a synergy with MTG-IRS could be beneficial: UTLS, winds... Claude Camy-Peyret concludes by advocating that the MAG could encourage such synergies and point out that studies should be initiated and/or supported by EUMETSAT.

Discussion:

Comment from Johannes Orphal: There is definitely a need of limb sounding missions in addition to the GEO/LEO sounders

Comment from Tony McNally: ECMWF is using H₂O and O₃ from MLS but not operationally for lack of quality/timeliness and also because these missions are not supposed to last.

Question from Nigel Atkinson: when is the launch of ALTIUS planned?

Answer from Claude Camy-Peyret: 2022. This would thus fit the MTG-IRS timeframe.

Comment from Johannes Orphal: ESA has performed studies to assess the potential of combined limb-nadir sounding. We should do the same to assess the benefits of such instruments.

Comment from Bojan Bojkov: we are open to support studies but they have to be based on a sound basis. It would be useful for EUMETSAT that group members come to next MAG with concrete ideas. We would then organise a session on that subject at the next MAG.

Action:

Action.M5.A3: all to come back at next MAG with some concrete study ideas on what could be done to exploit the synergy IRS-limb sounders that could then be investigated with a study. Action EUMETSAT to organise a session at the next MAG about limb sounding related activities.

[Scientific roadmap for the development of HyperSpectral InfraRed \(HSIR\) products: white paper status – Dorothee Coppens \(EUMETSAT\)](#)

Summary:

Overview of the content of the white paper defining the strategy of the HSIR competence area. It describes the challenges that HSIR will have to face and its main activities both on L1 and L2 fields in the next 5 years as well as the supporting elements. The white paper will be distributed to the MAG, the ISSWG as well as the SWG members before summer 2018.

Discussion:

Question from Herve Roquet: what about the AMVs?

Dorothee Coppens: they are addressed in a specific roadmap presented during the 43rd STG-SWG (and available through EUMEDS)

Comment from Bojan Bojkov: the roadmap is really setting the direction where we are heading in the next 5 years. Members of the group are thus invited to read the roadmap and see if it makes sense and if it fits the scope of IRS, IASI and IASI-NG.

Action:

Action.M5.A4: MAG members are thus invited to read the white paper and provide feedback to EUMETSAT.

[A presentation on “MTG IRS L1 possible apodisation” was planned in the agenda but was withdrawn](#)

The subject has been discussed after the presentation by Nigel Atkinson on day 1 “On the reversibility of MTG-IRS apodisation conversions”. The presentation will be put online for information.

[ATBD IRS L2: MAG review summary – Jochen Grandell \(EUMETSAT\)](#)

Summary:

A lot of feedback was received. 99 RIDs including 15 major ones, the main concern being the choice of the a priori in the optimal estimation module of the L2 processor (a long-standing subject that has been already discussed during several previous meetings). Jochen Grandell concludes that, given the achievements in the L2 area since this was discussed in 2013 and noting that both options (NWP forecast and PWLR3) for the a-priori are available in the baseline described in the L2 ATBD, the issue of prior information selection is reported to a later MAG meeting.

Discussion:

No discussion

Action:

No action taken

Recommendation:

No recommendation given

[MTG-IRS L2 update – Thomas August \(EUMETSAT\)](#)

Summary:

This presentation is split into two parts: prototype product development + Choice of the a-priori

1. IRS L2 prototype status

- Objective: specify a viable baseline for IRS L2 → reuse and adapt the IASI L2 operational concept
- Status: ATBD written, PS written, prototyping started; 1 full dwell requires 1 minute CPU time (non-optimized SW)

2. A-priori

- The IASI-approach includes a statistical all-sky method followed by a physical retrieval (OEM)
- The IRS L2 ATBD thus includes 2 options for the OEM a-priori: PWLR3 and NWP
- PWLR3 has advantages:
 - Forecast free
 - All-sky
 - Full disk
 - CPU light
- ... but also limitations:
 - Smooth profiles
 - Lower sensitivity in the PBL because of the instrument sensitivity
- Then, the subsequent OEM is:
 - Clear-sky only
 - CPU intensive
 - If using forecasts: fine-scale structure but also not model-independent
- Users have expressed their interest for Forecast-free information
- Several examples presented including the meaningfulness of the quality indicator available with PWLR3.

Discussion:

Question from Dave Tobin: is the format of the proxy data compliant with the L1FS?

Answer: not quite but this could be done after the update of the L1FS

Comment from Herve Roquet: thanks to those who provided RIDs. The answer to the important question of the a-priori is closely related to expected users (and it is thus important to identify them). We should agree on a way forward knowing that all options are open.

Comment from Christina Koepken-Watts: Strong need for information as independent as possible from the forecasts. It's also a major concern for the AMVs.

Comment from Thomas August: optical flow needs continuous fields *i.e.* all-sky retrievals as generated by the PWLR3 conversely to retrievals from the OEM initialised with forecast fields that are clear-sky only.

Comment from Tony McNally: of course the retrieved humidity must be independent from the forecasts (as is the case with PWLR3). However, if the scene is cloudy, there is no way to know what is below the cloud deck.

Answer from Thomas August: this is true but we have information at least down to the cloud top while the physical retrieval using the forecast as a-priori will provide nothing. Moreover, if the

scene is not completely overcast (i.e. cloud coverage of the order of 50%) we have information down to the surface. Profiles retrieved over cloudy scenes will in any case be flagged.

Comment from Pierre Coheur: the L2 ATBD is a very good document. Clear-sky only retrievals is not an option so we are happy with the PWLR3. Concerning the background, we also want to be independent from the model but we need to study the variability of the covariance matrix. He also wonders if information that could improve the retrievals in the PBL exists.

Comment from Claude Camy-Peyret: Document very interesting. How is the matrix S_a generated? Are the forecasts provided with a correct covariance? And what about the case of PLWR3?

Answer from Thomas August: this is described in the ATBD. But it is true that it is a critical parameter and that is actually an item discussed in the Hyperspectral Infrared roadmap: it is planned to liaise with the NWP centres to estimate it as accurately as possible.

Comment from Pierre Coheur: It is indeed important not to over-constrain the retrieval with the forecast.

Comment from Thomas August: do we agree to retain the approach described in the L2 ATBD for day-1 products?

Answer from Tony McNally: It should be based on user needs.

Comment from Bojan Bojkov: Indeed, we will do studies on special cases that will allow to characterize our products within 6 to 12 months. Discussion with and involvement of the users has started and will remain an important activity in the coming years.

Question from Herve Roquet: Would it possible to envisage within a short timeframe a kind of NRT experiment using the processor being developed and with both a-priori? IASI-EARS could provide both, PWLR3 and forecast a priori?

Answer from Thomas August: IASI-EARS has only PWLR3 but it would be possible to have a second livestream in IR-only (without forecast).

Question from Bojan Bojkov: Do we need to do this experiment in NRT?

Answer from Christina Koepken-Watts: Not necessarily. But we would need to have IRS-like data (resolution, sampling...)

Comment from Bojan Bojkov: this could be done on a couple of selected cases. So we need 5-10 cases that are time-pertinent for IASI (that will be used as a proxy) and which will be made available to the MAG members. Next MAG we address those cases.

Question from Christina Koepken-Watts: auxiliary data as well

Answer from Bojan Bojkov: why not, this could be useful for the evaluation.

Comment from Dieter Klaes: one aspect to keep in mind for the evaluation is: "is the profile useful for the forecasters?"

Comment from Herve Roquet: yes but it will be difficult to involve them and to separate NWC from NWP.

Comment from Miguel Martinez: using RTTOV12, we have the possibility to simulate clear or cloudy IASI spectra that could be used to perform retrievals and is another way to assess the performances.

Question from Herve Roquet: Users involvement is important; what is the relation with MTG-Up! ?

Answer from Jochen Grandell: MTG-Up! is still in its starting phase. In the timeframe we are talking, this is not an option

Comment from Chris Hartley: this will come later

Clarification given by Bojan Bojkov: Results of the performances evaluation will be documented and published, deadline is in 6 months.

Recommendation from Claude Camy-Peyret: If we take IASI for the testing, we should use only the wavenumbers corresponding to IRS channels

Question from Dorothee Coppens: Knowing that the IRS L2 ATBD has the two a-priori options (statistical and forecast), do we have the green light from the IRS-MAG to proceed?

Answer from all: yes.

Comment from Tony McNally: He is however “deeply uncomfortable” to present results based on a couple of profiles and to ask people to make a choice

Answer from Bojan Bojkov: again, this is just the first step

Question from Tony McNally: would it be a possible option that we have in the L2 products two retrieval corresponding to the two options?

Answer from Chris Hartley: for the moment it is not foreseen. But we may come to the conclusion that we need both.

Action:

Action.M5.A5: All to provide specific test cases to assess the potentiality of the L2 processing. External data (i.e. ground-based/in situ observations or sounding from other instruments) would be needed to complete the evaluation.

Recommendation:

Recom.M5.R5: To proceed with the current IRS L2 baseline as written in version V1B (dates 30 April 2018) of the IRSL2ATBD, including two options for the a-priori: PWLR3 and forecast data.

Discussion on the spectroscopy – Claude Camy-Peyret (IPSL)

Summary:

- Main absorbers in the IRS spectral bands: CO₂, H₂O, O₃. But there are many trace species that are weak contributors: CFCs, SO₂, NH₃, HNO₃...
- NWP RTM generally based on LBLRTM using HITRAN
- Retrievals generally make use of their own RTM, also often based on HITRAN
- LBL parameters for well identified lines: line position and intensity, energy, air-broadening, temperature dependence, air-shifting
- For heavy molecules (CFCs, SF₆), the LBL description is not appropriate → cross-section
- Problem of the description of the H₂O continuum (important for IRS); there is a

- new H₂O line shape, called Hartmann-Tran, for both core and far wings, i.e. for a consistent model of the H₂O lines and the continuum.
- There is definitely work needed to update the spectroscopy of H₂O for MTG-IRS.
- Approach to identify where new spectroscopy efforts are needed: look at spectral residuals after OEM retrievals, both for satellite soundings and ground-based FTS.

Discussion:

Question from Dieter Klaes: Could the IASI spectroscopic database be extended to IRS?

Answer from Claude Camy-Peyret: yes, we should take advantage of all existing databases that are well maintained

Comment from Pierre Coheur: IASI database has not been updated for years

Comment from Claude Camy-Peyret: RTTOV is using another database so there is an inconsistency even within EUMETSAT

Johannes Orphal: IRS should have its own database

Comment from Claude Camy-Peyret: yes but efforts to set it up should be coordinated

Johannes Orphal agrees: efforts should be coordinated by EUMETSAT to establish a common spectroscopic database for IASI, IASI-NG and IRS

Comment from Bojan Bojkov: we have 3 instruments covering the same spectral range so it makes sense to have a common database

Comment from Tony McNally: There exists already some coordination between LBLRTM and HITRAN. Our efforts should include the LBL community

Comment from Pierre Coheur: NH₃ is a good candidate where progresses in spectroscopy could be achieved;

Comment from Dave Tobin: spectroscopy is a major contributor to the covariance matrix, it is important to make progress in that field

Recommendation:

Recom.M5.R6: MAG recommend a coordination of the efforts to establish a common on the spectroscopic database that could serve the needs of IASI, IASI-NG and IRS. EUMETSAT could take that role.

Action:

Action.M5.A6: EUMETSAT to consider taking a leading role in coordinating the efforts aiming at building a common spectroscopic database.

[MTG-IRS Science plan – Jochen Grandell \(EUMETSAT\)](#)

Summary:

Short presentation on the status of the MTG science plan:

- Originally created in the early days of the programme (2008);
- Document not maintained since then;
- However, the expected science development call for such a plan that should be prepared in close collaboration with the MAG.

Way forward:

- take the IASI-NG science plan as example
- 1-2 MAG members as editor(s) agreeing on the ToC and selecting section captains

Jochen Grandell suggests that enough time is reserved during next MAG to discuss this issue

Discussion:

Comment from Dieter Klaes: we should be clear on the purpose of such document

Action:

Action.M5.A7: Claude/Dieter/Tony to come up with a table of content for the next MAG and to propose section book-captains.

Recommendation:

None

[ARRHENIUS: a geostationary carbon explorer for Africa, Europe and the Middle-East – Johannes Orphal \(EUMETSAT\)](#)

Summary

Presentation given by J. Orphal on behalf of A. Butz, University of Heidelberg, PI of the mission

- ARRHENIUS is a geostationary carbon process explorer that has been proposed to ESA Earth Explorer-10 call
- It embarks an imaging spectrometer in solar backscatter configuration (Butz et al., AMT, 2015) for a quasi-continuous mapping of CO₂, CH₄, CO and SIF
- Complementary to Sentinel-5 and -7
- MTG-FCI will provide cloud cover information for ARRHENIUS but synergies with Sentinel-4 (NO₂, HCHO) and IRS (CO, aerosols) are evident.

[AOB – All](#)

Nigel Atkinson asks if there will be an answer to the RIDs raised during the review of the L1ATBD

Answer from Dorothee Coppens: Most of the RIDs have been taken into account. The document is still evolving with the scenes analysis update and PC. We need to answer specific comments mainly given by Nigel Atkinson.

Action.M5.A8: EUM to provide them at next MAG

Next MAG will be on November 7th-8th in Brussels.

Recommendations:

| List of Recommendations | |
|---|---|
| Recom.M5.R1 | To use the hybrid approach i.e. global PCs on a stable basis of eigenvectors plus 5 local PCs. Linked to Action.M5.A1 |
| Recom.M5.R2 | To communicate in advance the eigenvectors operational updates. Linked to Action.M5.A8 |
| Recom.M5.R3 | To make the PC residuals for outliers available offline. For observations with poor reconstruction scores, likely associated with special local events, also make L1 products available offline, if possible. |
| Recom.M5.R4 | To implement the light apodisation in the operational IRS level 1 operational processing. The strong apodisation (Hamming on 3 points as it minimizes the number of “lost” channels) will be proposed as a post-processing option in the IRS-PP. |
| Recom.M5.R5 | To proceed with the current IRS L2baseline as written in version V1B (dates 30 April 2018) of the IRSL2ATBD, including two options for the a-priori: PWLR3 and forecast data. |
| Recom.M5.R6 | EUM to coordinate the efforts to establish a common spectroscopic database that could serve the needs of IASI, IASI-NG and IRS. |
| Recom.M5.R7 <i>As discussed at 36th STG-SWG March 2014</i> | IRS-MAG welcomes the changes in the IRS dissemination baseline plans (15 min. latency for L1, 30 min. for L2 products). However, it is noted that NWC requirements are even more stringent (aim of 15 min. for L2), so that any additional options to further improve the latency of L1 and L2 products should be explored since this will increase the usefulness of the data. |
| Recom.M5.R8 | MAG recommends the new sequence: 3x(LAC4,LAC3), 3x(LAC4,LAC2), 3x(LAC4,LAC3), 3x(LAC4,LAC1)) as the operational one. |

Actions:

| List of Actions | | | |
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| Action # | Action item description | Due date | Actionee |
| Action.M5.A1 | To include hybrid PC approach in the ATBD L1 and the processing specification and to update EURD (by end of June) accordingly. Linked to Recom.M5.R1 . | End of June 2018 | EUMETSAT |
| Action.M5.A2 | Nigel and Dorothee to compare the performances of each uniformisation method | next MAG | Nigel Atkinson/ Dorothee Coppens |
| Action.M5.A3 | To come back at next MAG with concrete ideas on what could be done in term of limb sounding, in particular in synergy with limb-sounding instruments such as ALTIUS. A session will be organised at the next MAG. | Next MAG | MAG members |
| Action.M5.A4 | MAG members are invited to read the HSIR roadmap and to give some comments. Important is to assess if the direction where EUM is heading in the next 5 years is the correct one and fits the scope of IASI, IASI-NG and IRS | Mid-July 2018 | MAG members |
| Action.M5.A5 | To provide specific test cases to assess the potentiality of the L2 processing. External data (i.e. ground-based/in situ observations or sounding from other instruments) would be needed to complete the evaluation. | End of August 2018 | MAG members |
| Action.M5.A7 | To come up with a concept and table of content of the IRS science plan and to propose book-captains for each section | Next MAG | Dieter Klaes/ Claude Camy-Peyret |
| Action.M5.A9 | To provide answer to the RIDs raised on the IRS L1 ATBD | Next MAG | EUMETSAT |
| Action.M5.A9 <i>As presented at 36th STG-SWG March 2014</i> | To prepare a proposal for the technical and communications procedure to be followed if an update of the global PC basis is necessary in IRS operations. The proposal should be circulated to IRS-MAG members for feedback. | Spring 2019 | EUMETSAT |
| Action.M5.A10 <i>As presented at 36th STG-SWG March 2014</i> | To establish which NWP centres envisage to assimilate retrievals for regional/convection resolving NWP | | EUMETSAT |
| Action.M5.A11 <i>As presented at 36th STG-SWG March 2014</i> | NWP centres with interest in L2 retrieval assimilation should work together with EUMETSAT to specify which ancillary information is needed in the L2 products, decide | | MAG members |

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| | on any additional necessary studies to address unresolved L2 assimilation issues and confirm whether NWC needs should drive L2 retrieval configuration, esp. w.r.t the choice of used a-priori profiles | | |
| Action.M5.A12 <i>As presented at 36th STG-SWG March 2014</i> | To establish, with users, e.g. the CAMS community, the potential to retrieve atmospheric composition products (like CO, O ₃ , NH ₃ and Aerosol Optical Depth) from MTG-IRS and consider whether this can be added as a Day-1 product. | Next coordination meeting in September | EUMETSAT (PoC: Sally Wannop) |
| Action.M5.A13 <i>As presented at 36th STG-SWG March 2014</i> | To establish with key users: a) Is the NWP background still the preferred choice for L2 retrievals? b) Should some parameters be retrieved independently of a NWP background a-priori (e.g. surface parameters, stability indices, TPW)? c) Which additional retrieved parameters are needed (stability indices, integrated quantities)? d) Which additional information is needed (quality indicators, used background profile, metadata)? | Spring 2019 | EUMETSAT |
| Action.M5.A14 <i>As presented at 36th STG-SWG March 2014</i> | NWC-SAF and NWP-SAF to circulate their list of planned tools for IRS to IRS-MAG and NMSs to solicit feedback on their plans and input for any additionally needed tools | Spring 2019 | MAG members |
| Action.M5.A15 <i>Follow-up of Action.M3.A4</i> | Johannes Orphal, Dave Tobin, and Claude Camy-Peyret to prepare a list of what parameters from the MTG-IRS breadboard are needed. | Autumn 2018 2019 | Johannes Orphal, Dave Tobin, and Claude Camy-Peyret |
| Action.M5.A16 <i>Follow-up of Action.M4.A2</i> | Circulate the IRS level 1 PFS to MAG members (new version coming by summer 2018) along with a test dataset in order to assess the metadata | Autumn 2018 | EUMETSAT |
| Action.M5.A17 <i>Follow-up of Action.M4.A5</i> | To give information on the duration expected of the data outage during the yaw flip manoeuvre on top of the 64 minutes of the flip itself. | Autumn 2018 | EUMETSAT (GEO) |
| Action.M5.A18 <i>Follow-up of Action.M4.A6</i> | Provide more information on geolocation accuracy | Autumn 2018 | EUMETSAT (GEO) |
| Action.M5.A19 <i>Follow-up of Action.M4.A8</i> | Consider the dissemination of the imager mode data or, at least, a measure of the scene heterogeneity | Autumn 2018 | EUMETSAT |
| Action.M5.A20 | Circulate the draft processing specification of | Autumn | Nigel |

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| <i>Follow-up of Action.M4.A10</i> | the IRS-PP | 2018 | Atkinson |
| Action.M5.A21 <i>Follow-up of Action.M4.A11</i> | Provide EUMETSAT with available information at ECMWF on the quality of radio-soundings | Autumn 2018 | Tony McNally |
| Action.M5.A22 <i>Follow-up of Action.M4.A12</i> | Present the results from the comparisons between the L2VDP and radio-soundings | Autumn 2018 | EUMETSAT |
| Action.M5.A23 <i>Follow-up of Action.M4.A15</i> | Action on EUMETSAT to circulate the presentation by C. Koepken-Watts and T. McNally about the needs in terms of IRS data and on MAG members to comment and provide feedbacks. | Autumn 2018 | |

“by next MAG” should be circulated 2 to 3 weeks before the meeting.