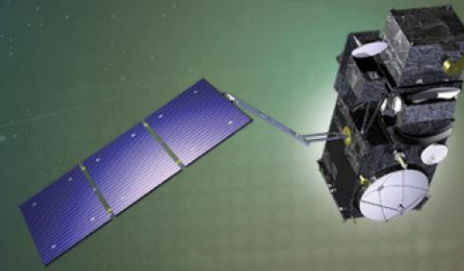




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7th Sentinel-3 Validation Team Meeting 2022

18-20 October 2022 | ESA-ESRIN | Frascati (Rm), Italy

Landcover & Temperature Session

Steffen Dransfeld & S3VT Land Group
ESA-ESRIN

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Landcover & Temperature Session

- 11 oral presentations (plus joint optical session)
- About 30 participants overall (mixed in presence and online)
- Thanks to all participants for the very productive discussions



Landcover & Temperature Session – Main outputs

SLSTR

- Validation results on the 5 new LST in situ stations (Copernicus LAW Project) show that overall SL_2_LST meets the MRD accuracy and GCOS precision criteria (< 1 K). Satellite - In situ biases were observed for Robson Creek station in Biome 5 (Broadleaved evergreen &/or semi-deciduous forest) affected by higher water vapour. Night-time coverage bias exists for many sites, especially for S3B: cloud flagging/masking may require updating.
- SLSTR LST shows also good consistency with SEVIRI/MODIS/VIIRS products, the joint information from the different sensors is a useful support in active volcano monitoring. The double view of SLSTR could also provide a more reliable sub-pixel level thermal information.
- SLSTR shows also good results in the retrieval of new snow products like snow grain size, snow particle shape, and specific surface areas. The new snow products are validated using both permanent (over Greenland, Antarctica and Japan) and campaign sites (over Canada, USA, Alps and China) for the period of 2016 – 2020 showing good agreements with both datasets.





Landcover & Temperature Session – Main outputs

OLCI

- OLCI L2 cloud mask validation using sky camera: results show quite comparable results with other techniques but currently there are few sites equipped with Sky cameras. The development is still in a prototype phase, but it could become a valuable source for cloud mask routine validation. Scope for a low-cost large-scale network contributing majorly to the cloud mask validation.
- GI-FAPAR is reaching a maturity and quality to become Fiducial OLCI Green-Instantaneous FAPAR product. Validation is globally performed using GBOV version 3 dataset including new sites and new upscaling approach showing good agreement.
- Uncertainty GI-FAPAR budget chain was designed using FIDUCEO concept at L2 and L3. Some information is still missing with and ongoing study to produce an uncertainty model for implementation at L2 building on the L1 radiometric uncertainties.
- OLCI used in a US-wide NDVI-based forest warning system reporting vegetation disturbances. Data are regridded to the MODIS grid and the system is shifting entirely to OLCI providing seamless continuity.



Landcover & Temperature Session – Main outputs

SYNERGY

- Good inter-comparison results between SYN_SDR vs MODIS and VIIRS especially after applying a BRDF correction as part of the validation procedure.
- NASA/GSFC is prototyping a S3 LaSRC based SR product starting from S3 L1 harmonized to MODIS calibration to potentially fill the gap from MODIS Terra Decommissioning. Overall comparison between MODIS SDR and SYN_SDR shows good agreement with scope for improving the SYN_SDR AOD retrieval.
- Large improvement of SYN_VGT was observed, leading to better consistency with the PROBA-V archive, but some quality issues remain open (adaptation of radiometric calibration, time series consistency, ...)



Landcover & Temperature Session – Main outputs

GENERIC SENTINEL-3 OPTICAL VALIDATION

- Presentation on ICOS (Integrated Carbon Observation) Network as source of validation for S3 optical products. ICOS is a large network starting to be built up with a multitude of sensors supporting validation of all variables contributing to the carbon cycle. A pilot activity is started to equip sites with LST radiometers. Moreover future developments aim to integrate also FAPAR ground measurements. ICOS is also of significant value to validation of atmospheric products. Data are typically provided with NRT (24hrs).

Landcover & Temperature Session – S3VT Recommendations

SLSTR

- To continue funding the LST in situ measurements from the new 5 stations deployed in LAW Project.
- SL_2_LST retrieval coefficients may need to be updated for biomes characterized by broadleaved and semi-deciduous forest impacted by high water vapour.
- Better visibility of SLSTR Calibration offsets to S3 Community. Currently only visible to current S3VT members by attending the event and new members this time were not aware of them.
- SLSTR study suggested to look at impact of false cloud shadow flagging on L1 and downstream retrieval for the different L2 communities (cf. Presentation by Carsten Brockmann in Optical Plenary session)
- Recommendation to perform a snow specific cloud masking study. Potential for Oblique/Nadir geometry to discriminate stationary snow from parallax-moving cloud.



Landcover & Temperature Session – S3VT Recommendations

OLCI

- To build up the Sky camera network for OLCI cloud mask validation. Anyone can apply and cameras are of the order of ~500 \$ and value of the network is in the number of sites.
- Recommendation to implement a dedicated L2 GIFAPAR uncertainty model using the new L1 radiometric uncertainties as input.
- Assess the applicability of cloud-shadow flagging (water or shadow flag raised for dark pixels) done within the GIFAPAR processing also in the OTCI processing.

Landcover & Temperature Session – S3VT Recommendations

SYNERGY

- SYN_SDR & SYN_VGT reprocessing is really a need. It can contribute to create a continuous and consistent time series of +25 years.
- Calibration adjustment factors of SLSTR and the results of OLCI tandem analysis should be implemented in the SYN_VGT branch, but this requires more investigations of the radiometric impact on the simulated Proba-V bands in the SYN_VGP product and consequentially on the NDVI of the SYN_VG1 product.
- To pursue for ARD compliancy and also better continuity with MODIS it is recommended to reproject SYN_SDR into MODIS sinusoidal tiling grid. Distribution of that product via on-demand processing for past and future acquisitions would have to be assessed if we want to maintain also an SDR_SYN product in the currently used OLCI image grid.
- Recommendation to implement the AOD retrieval module from the SYN_AOD product in the SYN_SDR product only maintaining the continental aerosol model.
- Recommendation to transfer the OLCI Idepix cloud shadow algorithm to the SYnergy branch.



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Big Thank You to all for the valuable contributions !

