



European Union
Programme



Sentinel-3 Product Notice – SYnergy

Mission		S3A & S3B
Sensor		SYNERGY products (combination of OLCI and SLSTR)
Product		<ul style="list-style-type: none">• SY_2_SYN
Product Notice ID		S3.PN-SYN-L2.03
Issue/Rev Date		27/02/2019
Version		1.0
Preparation		This Product Notice was prepared by the Sentinel 3 (S3) Mission Performance Centre and by ESA experts
Approval		ESA Mission Management

Summary

This is a product notice for the release of operational Sentinel-3 SYNERGY Level 2 products to user's community. The notice gives a clear indication of the current implementation for the retrieval of Surface Directional Reflectance (SDR) and Aerosol Optical Depth (AOD) parameters as well as their characteristics and potential (current) limitations. The products are currently available via the ESA S3 Expert Data Hub.

The Notice describes the current SYN_2 status, the processing baseline, the product quality and known limitations for both S3A and S3B.



European Union
Programme



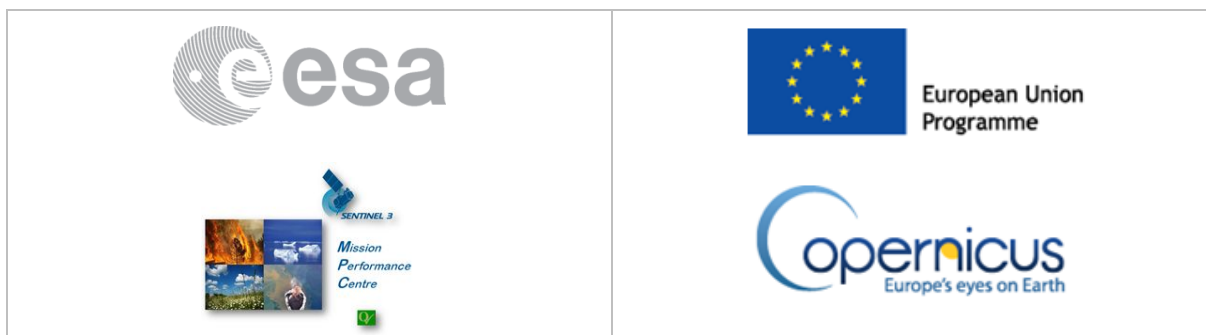
Processing Baseline

	S3A	S3B
Processing Baseline	<ul style="list-style-type: none"> IPF Processing Baseline: 2.44 	<ul style="list-style-type: none"> IPF Processing Baseline: 1.16
IPFs version	<ul style="list-style-type: none"> SY_2 IPF version: 06.16 SY_2_VGS IPF version : 06.07 	<ul style="list-style-type: none"> SY_2 IPF version: 06.16 SY_2_VGS IPF version : 06.07
	<ul style="list-style-type: none"> OL_1 IPF version: 06.08 	<ul style="list-style-type: none"> OL_1 IPF version: 06.08
	<ul style="list-style-type: none"> SL_1 IPF version: 06.16 	<ul style="list-style-type: none"> SL_1 IPF version: 06.16
	<ul style="list-style-type: none"> PUG version: 03.35 	<ul style="list-style-type: none"> PUG version: 03.35

Current Operational Processing Baseline

IPF	IPF Version	In operations since (creation date)
S3A		
OL1	06.08	12/12/2018 11:38 UTC
SL1	06.16	02/08/2018 09:32 UTC
SY2	06.16	16/01/2019 10:09 UTC
SY2-VGS	06.07	21/01/2019 10:09 UTC
PUG	03.35	12/06/2018 09:43 UTC
S3B		
OL1	06.08	12/12/2018 11:38 UTC
SL1	06.16	02/08/2018 09:32 UTC
SY2	06.16	16/01/2019 10:09 UTC
SY2-VGS	06.07	21/01/2019 10:09 UTC
PUG	03.35	12/06/2018 09:43 UTC

* S3B SYN products will be available from 27-Feb-2019 00 :00 UTC



Status of the Processing Baseline

S3A

The IPF processing baseline 2.44 for the SYNERGY level 2 products includes some major corrections and improvements which are summarised below:

- The SYN L2 VGT-like processing includes similar algorithms than PROBA-V concerning projection on 1 km grid and composite methods. The projection on the 1 km Plate carrée grid is no longer performed by a simple averaging of all 300m pixels geographically included in one box but using a stretched bi-cubic approach. This approach takes into account a larger geographical area, but weighted by the distance to center pixel. As result of this improvement, more geographical details are available on VGT-like product, providing a dataset more consistent with actual geographical area.

Concerning VGT composite methods, several selection rules have been added in addition to the “maximum NDVI” one. These rules are the same than the one applied on PROBA-V datasets and are driven by configuration parameters.

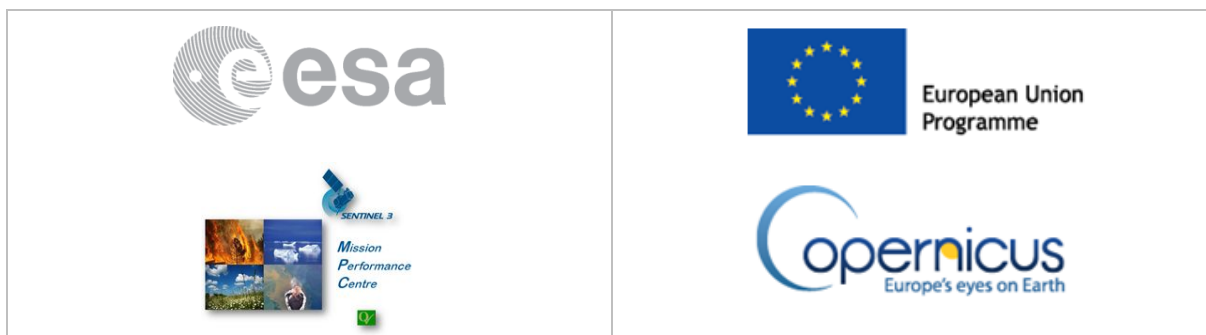
One major impact of these two evolutions is a better definition of the VGT status map. The VGT flags associated with each contributing pixel are taken into account in the final flag, weighted by the distance to the center pixel.

- The cloud and snow/ice flags defined at SYNERGY L2 processing are now duplicated in VGT flags for consistency reason. In addition, several issues detected on cloud flag, such as blockiness detected at the edge of the cloud mask have been corrected

S3B

The IPF processing baseline 11.6 for the SYNERGY level 2 products includes some major corrections and improvements which are summarised below:

- The SYN L2 VGT-like processing includes similar algorithms than PROBA-V concerning projection on 1 km grid and composite methods. The projection on the 1 km Plate carrée grid is no longer performed by a simple averaging of all 300m pixels geographically included in one box but using a stretched bi-cubic approach. This approach takes into account a larger geographical area, but weighted by the distance to center pixel. As a result of this improvement, more geographical details are available on VGT-like product, providing a dataset more consistent with actual geographical area.



Concerning VGT composite methods, several selection rules have been added in addition to the “maximum NDVI” one. These rules are the same than the one applied on PROBA-V datasets and are driven by configuration parameters.

One major impact of these two evolutions is a better definition of the VGT status map. The VGT flags associated with each contributing pixel are taken into account in the final flag, weighted by the distance to the center pixel.

- The cloud and snow/ice flags defined at SYNERGY L2 processing are now duplicated in VGT flags for consistency reason. In addition, several issues detected on cloud flag, such as blockiness detected at the edge of the cloud mask have been corrected.

Known product quality limitations

Common to S3A and S3B

Despite these evolutions and corrections, some choices and limitations need to be underlined :

- To avoid strong interfaces between the different aerosol models, and waiting for an update of the corresponding Auxiliary Data Files, **only the continental model is taken into account**. This limitation can create erroneous patterns over deserts or mountains.
- Similarly to OLCI level 2 products, camera interfaces can also be visible on some SYN L2 products.
- As the **aerosol retrieval is supposed to be more accurate on “dual-view” area**, a transition between “nadir only” and “dual view” area can be observed in some SYN L2 products. In a majority of products, this transition is visible through sharp differences in the Aerosol Optical thickness Values.
- When the OLCI orbit file starts in ascending mode, an operational issue can prevent the SLSTR data to be well-handled by the SYN L2 module. There will be then no SLSTR data in the SYN product and the aerosol retrieval will be performed using only OLCI pixels. To avoid empty SYN L2 files, **only the descending orbits parts will be considered in the PDGS production**. A full technical solution is currently investigated
- The combination of {SYN_success; SYN_aerosol_filled; SYN_AOT_climato} flags can be misleading. These flags are firstly defined on the macro-pixel resolution. Then, during the aerosol interpolation, for each 300m pixel, the flags associated with the 4 closest macro-pixels are taken into account :
 - If only one of these macro-pixels is flagged cosmetic fill SYN_aerosol_filled or



European Union
Programme



SYN_AOT_climato, the 300m pixel is flagged accordingly.

- However, the 300m pixel is flagged as SYN_success if the 4 macro-pixels are flagged as SYN_success.

As a consequence, depending on the used macro-pixels, a 300m pixel can be flagged by both SYN_AOT_climato and SYN_aerosol_filled.

If successfully retrieved AOT values are available, those will be always used for the interpolation. However, if a 300m pixel is interpolated from 3 SYN_success macro-pixels and one SYN_aerosol_filled macro-pixel, it will be flagged as SYN_aerosol_filled and not SYN_success

- On some rare occasions, scanlines are missing from SLSTR input S3A (nadir & oblique) over Antarctica, S3B (oblique) latitude $\sim -22^\circ$ S
- Rectangular patterns may be visible on SYNERGY L2 products in the SDR and Aerosol values over Sahara site

Specific to S3A

- Nothing specific to S3A

Specific to S3B

- Nothing specific to S3B

Products Availability

- Copernicus Open Access Hub (<https://scihub.copernicus.eu/>)
- S3 Expert Users Data Hub
- Other

Any other useful information

- None



European Union
Programme



User Support

- Questions about SYN products can be asked to the Sentinel-3 User Support desk at:
 - eosupport@copernicus.esa.int

References

- OLCI L1 Product Notice
 - S3.PN.OLCI-L1.04, v1.0 dated on 12/12/2018
- SLSTR L1 Product Notice
 - S3.PN.SLSTR-L1.06, v1.1 dated on 19/11/2018
- Product Data Format Specification – SYNERGY Level 1 & 2 Instrument Products, Ref: S3IPF.PDS.006, Issue: 1.9, Date: 04/12/2017

<https://sentinel.esa.int/web/sentinel/user-guides/sentinel-3-synergy/document-library>



European Union
Programme



Static ADFs

S3A

- S3A_SL_1_MCHDAX_20160216T000000_20991231T235959_20170120T120000_____MPC_O_AL_003.SEN3
- S3A_SY_1_GCPBAX_20160216T000000_20991231T235959_20170120T120000_____MPC_O_AL_003.SEN3
- S3A_OL_1_MCHDAX_20160216T000000_20991231T235959_20170120T120000_____MPC_O_AL_003.SEN3
- S3A_SY_1_PCP_AX_20160216T000000_20991231T235959_20170120T120000_____MPC_O_AL_005.SEN3
- S3_SY_1_CDIBAX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
- **S3A_SY_2_PCP_AX_20160216T000000_20991231T235959_20181207T120000_____MPC_O_AL_005.SEN3**
- S3A_SY_2_RAD_AX_20160216T000000_20991231T235959_20170427T120000_____MPC_O_AL_002.SEN3
- S3A_SY_2_RADPAX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
- S3A_SY_2_RADSAX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
- S3A_SY_2_SPCPAX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
- S3_SY_2_AODCAX_20000101T000000_20991231T235959_20180704T120000_____MPC_O_AL_001.SEN3
- **S3A_SY_2_PCPSAX_20160216T000000_20991231T235959_20181207T120000_____MPC_O_AL_002.SEN3**

S3B

- S3_SY_1_CDIBAX_20000101T000000_20991231T235959_20151214T120000_____MPC_O_AL_001.SEN3
- S3B_SY_1_GCPBAX_20180425T000000_20991231T235959_20180409T120000_____MPC_O_AL_001.SEN3
- S3B_SL_1_MCHDAX_20180425T000000_20991231T235959_20180409T120000_____MPC_O_AL_001.SEN3
- S3B_OL_1_MCHDAX_20180425T000000_20991231T235959_20180409T120000_____MPC_O_AL_001.SEN3
- **S3B_SY_2_PCP_AX_20180425T000000_20991231T235959_20180706T120000_____MPC_O_AL_002.SEN3**
- S3B_SY_2_RAD_AX_20180425T000000_20991231T235959_20180409T120000_____MPC_O_AL_001.SEN3
- S3B_SY_2_RADPAX_20180425T000000_20991231T235959_20180409T120000_____MPC_O_AL_001.SEN3
- S3B_SY_2_RADSAX_20180425T000000_20991231T235959_20180409T120000_____MPC_O_AL_001.SEN3
- S3B_SY_2_SPCPAX_20180425T000000_20991231T235959_20180409T120000_____MPC_O_AL_001.SEN3
- S3_SY_2_AODCAX_20000101T000000_20991231T235959_20180704T120000_____MPC_O_AL_001.SEN3
- **S3B_SY_2_PCPSAX_20180425T000000_20991231T235959_20181207T120000_____MPC_O_AL_002.SEN3**

In red, updated ADFs

End of the Product Notice