







S3 Product Notice - SLSTR

Mission	S3A and S3B		
Sensor	SLSTR		
Product	Level 2 Land Surface Temperature		
Product Notice ID	S3.PN-SLSTR-L2L.05		
Issue/Rev Date	16/09/2022		
Version	1.0		
Preparation	This Product Notice was prepared by the S3 Mission Performance Centre and by ESA experts		
Approval	ESA Mission Management		

Summary

This is a Product Notice for the release of Sentinel-3 Sea and Land Surface Temperature Radiometer (SLSTR) Level-2 Land Surface Temperature product for both S3A and S3B. The Notice describes the SLSTR current processing baseline relevant to Land Surface Temperature, product quality and limitations, and product availability.









Processing Baselines

	Common to S3A/S3B	
Processing Baseline ID	Processing Baseline: SLLST.004.07.00	
IPFs version	 SL_1 IPF version: 06.19 (PB: SL_L1004.04.00) SL_2_LST IPF version: 06.21 PUG version: 3.45 	

Current Operational Processing Baseline

IPF	IPF Version	In operation since (creation date)
S3A SL1	06.19	09/02/2022
S3A SL2	06.21	23/08/2022
S3B SL1	06.19	09/02/2022
S3B SL2	06.21	09/09/2022
PUG	03.45	19/07/2022









Status of the Processing Baseline

S₃A

Level-2 LST Products

• The performance against in situ measurements remains within mission requirements of 1 K.

S₃B

Level-2 LST Products

• The performance against in situ measurements is within mission requirements of 1 K.

Product Updates

Common to S3A and S3B

LST Uncertainty

- For each pixel, different components of uncertainty are provided, representing the uncertainty from effects whose errors have distinct correlation properties:
 - random (no correlation of error component between cells);
 - locally systematic (correlation of error component between "nearby" pixels);
 - [large-scale] systematic (correlation of error component between "distant" pixels).
- Locally correlated errors are modelled via spatio-temporal correlation length scales that determine
 how an observation influences the analysis in the vicinity of its time-space location. Systematic
 errors are accounted for by allowing a bias to be determined within the analysis procedure between
 different sources of data, whose magnitude is conditioned by the uncertainty attributed to
 systematic effects. Since all effects can be treated independently, the total uncertainty per pixel is
 acquired by adding all the components in quadrature.
- The LST uncertainty model fields in the SL_2_LST data product are as follows:
 - "LST_uncertainty" the total uncertainty
 - "LST uncertainty random" the random component as a result of the instrument noise
 - "LST_uncertainty_locT" the locally correlated component as a result of the instrument calibration









- ➤ "LST uncertainty locATM" the locally correlated component as a result of atmospheric errors
- "LST_uncertainty_locSF" the locally correlated component as a result of surface emissivity errors
- "LST uncertainty locGEO" the locally correlated component as a result of geolocation errors
- "LST_uncertainty_sys" the large-scale systematic uncertainty

Note that uncertainties are available for image and orphan pixels. However, as LST_uncertainty_locGEO is depending on neighbouring pixels, this data is set to 0 for orphan pixels.

Snow Masking

- For any given orbit every pixel is assessed for non-permanent snow and ice cover, since prior knowledge of the surface type is required in order to allow application of the most appropriate LST retrieval coefficients.
- Snow masking information in the Northern Hemisphere (NH) is provided by the Interactive Multisensor Snow and Ice Mapping System (IMS) Daily Northern Hemisphere snow and ice analysis. IMS data are not available for the southern hemisphere, so transient snow and ice is identified using an approach based on the methods of Istomina et al., 2010.
- The snow mask is provided as a flag in the "confidence_in" word.

Probabilistic cloud screening

• Since the 09th February 2022 10:00 UTC, this cloud module is performed directly on SLSTR L2 processing and is then provided over image pixels and orphan pixels.

However, an issue impacted all products between 09/02/2022 and 23/08/2022 for S3A / 09/09/2022 for S3B. The SLSTR L2 LST processing is performed per block of 2500 lines and the cloud module could not be performed over the last 16 rows of each block. These 16 rows were then wrongly associated with a clear-sky flag. This issue is now corrected

Specific to S3A

Nothing specific to S3A

Specific to S3B









Nothing specific to S3B

Known product quality limitations

Common to S3A and S3B

Orphan dataset:

- Further to the updated SLSTR L1 regridding approach, some orphan pixel can be associated with a
 scan index lower than the first contributing scan index associated to each line, provided in the time
 file and corresponding to the image pixel. To avoid internal operational issues at the first row of
 SLSTR L2 images when the SLSTR L1 radiometric image is re-projected on the instrument grid it
 has been chosen to discard from processing these orphan pixels; They are thus associated with a
 FillValue in the LST dataset.
- The Bayesian_orphan dataset is wrongly indexed on the image grid, instead of being indexed on the orphan dataset. However, flags are still valid and can be easily transferred to orphan dataset:
 - The bayesian_orphan parameter provided for row N and column M should be associated with the Mth orphan located on row N.

This issue will be corrected by the end of 2022.

Specific to S3A

Nothing specific to S3A

Specific to S3B

Nothing specific to S3B









Products Availability			
☐ Copernicus Open Access Hub (https://scihub.copernicus.eu/), NRT and NTC			
☐ ESA Internal Hub for Experts (https://inthub.copernicus.eu/s3exp/), NRT and NTC			
☑ Other: TDS provided to users			
Any other useful information			
Any other userui information			
• None			
User Support			
Questions about SLSTR products can be ask to the Sentinel-3 User Support desk at:			
eosupport@copernicus.esa.int			

References

- SLSTR L1 Product Notice, ref. S3.PN.SLSTR-L1.08, version 1.0, dated on 18/05/2021
- Product Data Format Specification SLSTR Level 2 Land Products, Ref: S3IPF.PDS.005.2, Issue: 2.9, Date: 26/08/2020

https://sentinel.esa.int/web/sentinel/user-guides/sentinel-3-slstr/document-library

• SLSTR Land User Handbook:

https://sentinel.esa.int/documents/247904/4598082/Sentinel-3-SLSTR-Land-Handbook.pdf/

Static ADFs

S3A









•	S3SL_2_LSTBAX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3
-	S3SL_2_LSTVAX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3
-	S3SL_2_LSTWAX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3
•	S3A_SL_2_F1N_AX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3
•	S3A_SL_2_S7N_AX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3
•	S3A_SL_2_S8N_AX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3
-	S3A_SL_2_S9N_AX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3
-	S3A_SL_2_LSTCAX_20160216T000000_20991231T235959_20190215T120000	MPC_O_AL_003.SEN3
-	S3A_SL_2_LSTEAX_20160216T000000_20991231T235959_20210413T120000	MPC_O_AL_003.SEN3
-	S3A_SL_2_PCP_AX_20160216T000000_20991231T235959_20210413T120000	MPC_O_AL_006.SEN3
•	S3SL_2_IMSCAX_20160216T000000_20991231T235959_20210413T120000	MPC_O_AL_001.SEN3
•	S3A_SL_1_RTT_AX_20160216T000000_20991231T235959_20211201T120000	MPC_O_AL_002.SEN3
•	S3A_SL_1_IRE_AX_20160216T000000_20991231T235959_20180202T120000	MPC_O_AL_001.SEN3
•	S3A_SL_1_LCC_AX_20160216T000000_20991231T235959_20201015T120000	MPC_O_AL_002.SEN3
	S3B	
•	S3SL_2_LSTBAX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3
	S3SL_2_LSTBAX_20000101T000000_20991231T235959_20151214T120000 S3SL_2_LSTVAX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3 MPC_O_AL_001.SEN3
•	S3SL_2_LSTVAX_20000101T000000_20991231T235959_20151214T120000	
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	S3SL_2_LSTVAX_20000101T000000_20991231T235959_20151214T120000	MPC_O_AL_001.SEN3 MPC_O_AL_001.SEN3
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In red: modified ADFs









End of the Product Notice