Title:

S-1A Products with RFI degradation acquired between 2014-09-15 and 2022-03-31.

Description:

The Sentinel-1 products can be affected by Radio Frequency Interference (RFI) when the SAR instrument receives electromagnetic signal from other C-Band emitters.
Only a subset of the products is impacted by such degradation corresponding to portions of the products with degraded product radiometry.

Until 2022-03-23, the SAR processor was not able to detect and mitigate the RFI.
From 2022-03-23 and the deployment of SAR processor IPF 003.51, the processor performs a pre-screening of potential RFI and applies an RFI mitigation process.

The purpose of this quality disclaimer is to acknowledge the presence of RFI degradation on a subset of products in the period 2014-09-15 to 2022-03-31. This quality disclaimer does not provide the detail of impacted products.

From 2022-04-01 a specific monitoring of residual RFI (RFI not successfully mitigated by the processor is in place) on EW/IW/SM acquisitions, however this monitoring cannot be exhaustive. Series of quality disclaimers will be issued to report the list of products impacted by residual RFI.

Degradation types:

- ☒ DEGRADED_PRODUCT_RADIOMETRY
- ☐ DEGRADED_RADIOMETRIC_CALIBRATION
- ☐ DEGRADED_ORBIT_CONTROL
- ☐ COMPLETE_PRODUCT_DEGRADATION
- ☒ DEGRADED_PHASE
- ☐ DEGRADED_PRODUCT_GEOLOCATION
- ☐ DEGRADED_PLATFORM_POINTING
- ☐ DEGRADED_PERFORMANCE_INSTRUMENT_ANOMALY
- ☐ SLICE_PRODUCT_NON_CONCATENABLE
- ☐ OTHER

Degradation percentage[1]:

1%

Only a subset of the products acquired in the period are affected.

Only parts of the affected products are impacted by the degradation.

Impacted products:

Platform: ☒ S-1A ☐ S-1B ☐ S-1C

Acquisition mode: ☒ EW ☒ IW ☒ SM ☒ WV ☐ RF

Product type: ☐ RAW ☒ SLC ☒ GRDM ☒ GRDH ☒ GRDF ☒ OCN

Polarization: ☒ SH (Single pol. H) ☒ SV (Single pol. V) ☒ DH (Double pol. H) ☒ DV (Double pol. V)

Processing facility: N/A

IPF version: N/A

Instrument Configuration ID (RDB): N/A

ADF files:

AUX_INS	N/A
AUX_CAL	N/A
AUX_PP1	N/A
AUX_PP2	N/A
AUX_SCS	N/A

[1] Percentage of degradation of the data in the product (100% means that the product should be masked in the product catalogue)

Period of the issue:

	Start	Stop
Acquisition date	2014-09-15T00:00:00	2022-04-01T00:00:00
Generation date	2014-09-15T00:00:00	2022-04-02T00:00:00
Orbit	2396	31588
Datatake (hex)	0028FE	0513FF

Cause:

Sentinel-1 is transmitting and receiving electromagnetic pulses in C-Band. This frequency band is shared with other emitters that can interfere with the signal received by the Sentinel-1 SAR, causing Radio Frequency Interference (RFI).
Before 2022-03-23, no specific processing was in place to detect and mitigate potential RFI.
Since IPF 3.51, deployed in 2022-03-23, the SAR processing implements a pre-screening and a mitigation of the RFI. However, this pre-screening/mitigation does not allow removing all the interferences in the SAR product.

Status:

Residual RFI can then be observed on SAR images as large stripes, or series of high energetics spots.
Example of RFI observed in the reported period are presented in the Sentinel-1 annual performance reports for the period 2014-2021 available on ESA Sentinel Online website.

References:

- MPC ref: MPCS-969, MPCS-2045