

ROC Status

*RPW Team meeting,
Nov. 30, 2021*



solar orbiter



RPW science survey data

- Production and dissemination are nominal in overall
- Main issues:
 - [THR_CALBAR-issue45]: TNR time stamping issue fixed by FSW upgrade on Oct.19 (CLOSED)
 - [THR_CALBAR-issue76]: HFR time stamping issue might be due to FSW (OPEN)
 - [TDS_CALBA-issue79]: TDS bug in SWF L2 (OPEN). See TDS-CALBA slide hereafter.
- Still few remaining features to implement (QUALITY_BITMASK/QUALITY_FLAG, MODS, KCOEFF CDF, ...) and minor inconsistencies to fix in CDF metadata. To be done during first semester of 2022.

RPW data visualization

- OK for daily summary plots (<https://rpw.lesia.obspm.fr/rpw-data/daily-summary-plots/>)
- Quicklooks to be done during first semester of 2022.

SBM data

- SBM L1 CDF data production should start on 2022 (delayed due to current investigations of data time-stamping)
- First prototype of a SBM event selection Web tool (SISSI) developed. Will be used by the RPW Operation Board (ROB) to select SBM event data to downlink.
- Dedicated "SBM summary plots" will be freely accessible from the RPW Web page (<https://rpw.lesia.obspm.fr/>)

SOLO S/C HK data

- New release in preparation (before the end of the week)
- Some requested HK parameters still missing before Nov. 2020

Ancillary data

- Orbit Digest CDF now being distributed by SOC on a more regular basis
 - Available from SOC Confluence page (<https://issues.cosmos.esa.int/solarorbiterwiki/display/SOSP/Trajectory+Overview+-+10+February+2020+Launch>)
 - Copies will be distributed by ROC in <https://rpw.lesia.obspm.fr/roc/data/private/solo/soc/spice/cdf/>)

Other works in progress

- Radiomonitoring
- Sunpy
- ...

LFR ground segment software



Current status

- L1 to L1R pipeline produces :
 - CWF in SBM1, SBM2 and SURV mode.
 - SWF in SURV mode.
- L1 to L2 pipeline produces :
 - BP1 in SBM1, SBM2 and SURV mode.
 - BP2 in SBM1, SBM2 and SURV mode.
 - ASM in SURV mode.
- Summary plots for BP1, BP2 and ASM.

Recent updates

- BP1, BP2 and ASM data are now also available in SRF frame.
- Calibrations were updated (cf Chust et al. A&A 2021, with $L_{\text{eff}} = 7\text{m}$, and other specific factors ...).
- Summary plots were adapted to the new calibration.

Upcoming upgrades

- Summary plots for BP1, BP2 and ASM in SRF frame.
- Management of the new k-coefficients and the new onboard calibration (2022).

TDS-CALBA - version 2.0.2

- ❑ Major revision of Calba calibration software recently released (2.0)
 - Implements changes in CDF structure, reduces drastically the L2 size.
 - Format is now quite efficient.
- ❑ L2 SURV-MAMP, SURV-STAT, SURV-HIST1D, SURV-HIST2D - OK
- ❑ L2 SURV-TSWF & SURV-RSWF **under revision:**
 - We found a serious issue in the 2.0 version, impacting TSWF and RSWF waveforms (voltage_data is incorrect, some calibration not applied correctly).
- ❑ L1R TDS SURV data for SCM **needs a new calibration table** after 19/10/2021 when TDS flight software patch was applied.

- ❑ New release of **TDS-CALBA 2.1.0** expected soon:
 - fixes the above issues
 - implements new calibration tables
 - Provides ISTP compliant CDFs

THR CALBAR V2.3.3

CALBAR products:

solo_L2_rpw-tnr-surv cdag_yyyymmdd_Vxx.cdf

solo_L2_rpw-hfr-surv cdag_yyyymmdd_Vxx.cdf

- voltage power spectral density (in $V^2 \text{ Hz}^{-1}$) – receiver level → OK
- flux density (in $\text{W m}^{-2} \text{ Hz}^{-1}$) – antenna level, **not yet implemented**

Minor changes expected in the next release:

- finalize the calibration at the antenna level by using the effective lengths calculated on flights (**Vecchio et al., A&A special issue, 2021**)
- check the normalization of the cross-calibration products
- provide ISTP compliant CDFs

Status of BIAS Calibration S/w (BICAS)

RPW consortium meeting 2021-11-30 – 2021-12-02, Erik P G Johansson, IRF, Sweden

- BICAS v6.0.0 running at ROC
 - Seems reliable
- Anticipated/desirable future updates:
 - Describe s/w updates in CDF glob. attr. “MODS” (as previously agreed)
 - Implemented, but disabled awaiting ROC go-signal (as previously agreed)
 - Apply transfer function in time-domain
 - Currently using frequency domain
 - Add quality bit for “discrete events”
 - Set quality bits for saturation automatically
 - Currently hardcoded in list
 - Remove thruster firings from L2 using L1/L1R QUALITY_BITMASK: Waiting for ROC implementation
 - Current implementation uses hardcoded list
 - Remove bias sweeps from L2 using L1/L1R QUALITY_BITMASK: Waiting for ROC implementation
 - Current implementation uses mux mode for removing sweeps



deliveries

- V0.14.0 (06/12/2020)
 - Improves the flagging of the data impacted by the heaters (bit 1 of L2_QUALITY_BITMASK).
- V1.0.0 (24/06/2021)
 - Support of master CDF V13
 - Resize the L2 CDF snapshots when possible
 - Improves the calibration of continuous waveforms (60% overlapping) to reduce jumps
 - Improves the accuracy of B_{RTN} (1 rotation matrix every second)
 - Significantly improves the running time to compensate the lost due to overlapping
- V1.1.0 (to come)
 - Further improvements of the calibration by using more overlapping → Increase of the running time for ROC.



SCM_QL3



deliveries

- V1.0.0 (20/04/2021)
 - Creation of spectrograms from L2 LFR magnetic snapshots :
solo_L3_rpw-lfr-surv-swf-b_*_scm-spect-[12].png
- V1.1.0 (to come soon)
 - Creation of spectrograms from L2 LFR continuous waveforms :
solo_L3_rpw-lfr-surv-cwf-b_*_scm-spect-[12].png
 - Creation of spectrograms from L2 LFR continuous SBM1 waveforms :
solo_L3_rpw-lfr-sbm1-cwf-b_*_scm-spect-[12].png



RCS STATUS

Current L1R/L2 Processing :

- BICAS V6.0.0
- LFR_CALBUT V2.0.2
- SCMCAL V1.0.0
- TDS_CALBA V2.0.2
- THR_CALBAR V2.3.3

Current L3 Quicklook & Summary Plots Processing :

- BIA_QL3 V1.2.1
- LFR_CALBUT V2.0.2
- SCM_QL3 V1.0.0
- TDS_QL3 V1.5.2
- TNR_QL3 V0.4.4 (TNR quicklook plots + TNR-HFR summary plots)



The holiday season is coming... No L2 reprocessing (with new RCS release) will be done during the period:

Monday 13/12/2021 - Monday 03/01/2021