



11 Mar 2024 (report covers data release for 1-31 Oct 2021)

Report Version	2	L2 ground processing software version:	V2.26.1
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Data Summary

V2 updates 2024:

After an investigation by ESA, Airbus and Imperial, the unexplained spacecraft interference has been confirmed not to impact the science quality of the OBS data. Cleaning of data around thruster firings requires use of the contaminated IBS data so users should beware of data during these periods, which can be identified by the thruster flag. These now re-released periods have also been quality flagged to level 2, due to the effect on the IBS data, as IBS-OBS is also an important tool in offset determination. This SC interference had historically resulted in the data not being released for these periods. The MAG team is now working to re-release these previously retracted periods, please see the Appendix for the periods now released.

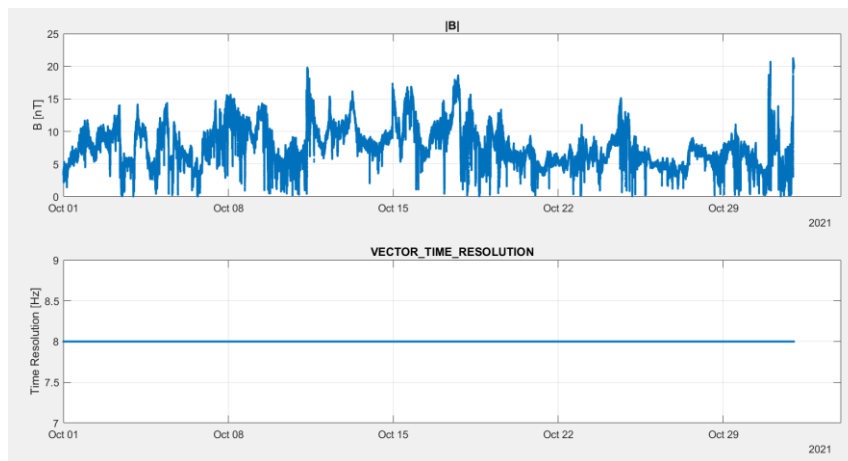
V1:

MAG was on for the period 1-31 october 2021.

Spacecraft noise was observed particularly in IBS data for several periods (there was significant noise for a total of 7.3 hour in the period 1-31 Oct). This noise is very clear in IBS, the source has not been identified. We can see evidence for it being there in OBS as well, and have not got algorithms to clean this from the data. The magnetic field data have been converted to NaNs when the noise in the data was particularly high. The full period of missing data is listed in the appendix of this report. If you have particular need for any data during these periods, please contact the MAG team and we see if the data maybe suitable for release for certain applications.

The spacecraft started the month at 0.64AU and ended it at 0.82AU.

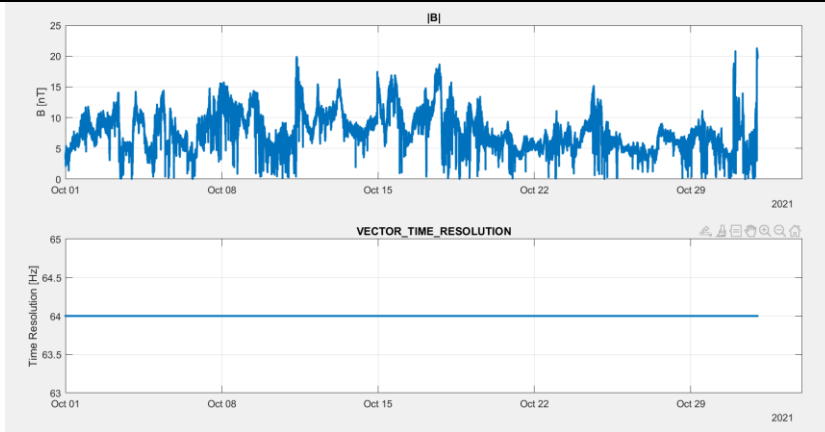
Normal Mode



MAG was on with 8Hz cadence normal mode data returned, for exceptions see below.

Operations	1-31 October	Cruise phase throughout period, normal data returned
Operational Events of Note	None	
<p>Data Gaps greater than one minute: NaNs have been introduced when the vector range was 0 or 1 in the period 15-20 October.</p>		

Burst Mode



Coverage continuous. Data at 64 Hz cadence.

Coverage	From	To	Coverage
	1/10	31/10	24 hours 64 Hz per day

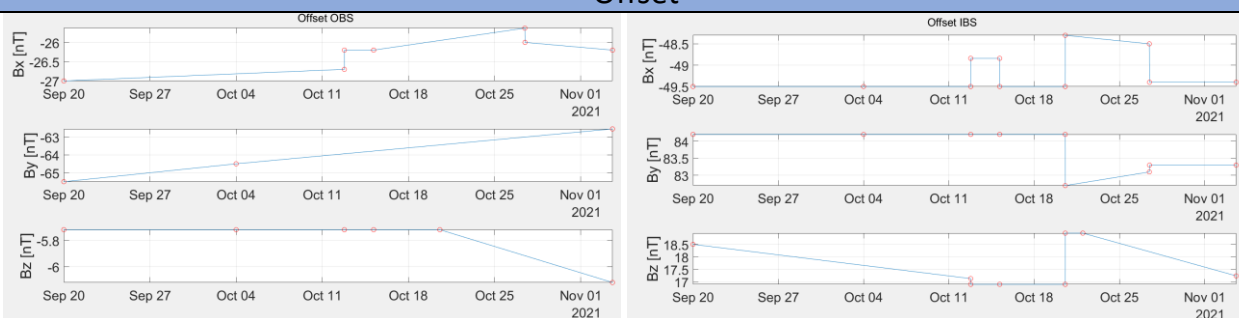
Quality bitmask



Quality bit mask events

SC events which disturb the field	<ol style="list-style-type: none"> 1. Thruster firings 2. Solar array lubrications (solar array is moved 15 degrees, then returned to original position) 3. Solar array movements (solar array angle is changed, and then remains at new angle due to sun-SC distance thermal constraints) 4. High gain antenna movements 		
SC related issues	Time	Reason	
	12/10/2021 19:09	SA movement: from 60 to 56 deg	
	20/10/2021 13:22	SA movement: from 56 to 30 deg	
	27/10/2021 11:05	EUI turned on: step change in MAG data	
	31/10/2021 06:29-14:52	PCDU-A in use instead of PCDU-B	

Offset



1-31 October:

OBS Bx and By offsets linearly changed from the reboot in September to the first days of November. OBS Bz remained constant until the SA movement on 20/10/2021, when the linear trend started; it ended on the first days of November. On 27/10/2021 EUI turned on, modifying both IBS and OBS offsets.

IBS offsets have been modified by the SA movement on 12/10/2021 and 20/10/2021 and changes in range on 15/10/2021.

These offsets have been quantified and removed from the L2 data.

Offset #	Date	OBSX	OBSY	OBSZ	IBSX	IBSY	IBSZ	Comment
190	20/09/2021 00:00	-27	-65.5	-5.72	-49.5	84.2	18.5	Post reboot
191	04/10/2021 00:00		-64.5	-5.72	-49.5	84.2		Change of linear trend in OBS
192	12/10/2021 19:09	-26.7		-5.72	-49.5	84.2	17.13	Pre SA movement
193	12/10/2021 19:10	-26.2		-5.72	-48.84	84.2	16.9	Post SA movement
194	15/10/2021 04:10	-26.2		-5.72	-48.84	84.2	16.9	Pre IBS range change
195	15/10/2021 04:13	-26.2		-5.72	-49.5	84.2	16.9	Post IBS range change
196	20/10/2021 13:22			-5.72	-49.5	84.2	16.9	Pre SA movement
197	20/10/2021 13:27				-48.3	82.7	18.95	Post SA movement
198	22/10/2021 00:00						18.95	End influence after SA movement
199	27/10/2021 11:05	-25.63			-48.5	83.1		Pre EUI step
200	27/10/2021 11:23	-26			-49.4	83.3		Post EUI step
201	03/11/2021 14:05	-26.2	-62.55	-6.12	-49.4	83.3	17.24	IBS range change
190	03/11/2021 14:05	-26.2	-62.55	-6.12	-49.6	83.2	17.24	Final offset

SC Interference Re-Release

After an investigation by ESA, Airbus and Imperial, the unexplained spacecraft interference (SC interference) has been confirmed not to impact the science quality of the OBS data, so this is no longer being removed from these periods. Cleaning of data around thruster firings requires use of the contaminated IBS data so users should beware of data during these periods, which can be identified by the thruster flag. These now re-released periods have also been quality flagged to level 2, due to the effect on the IBS data, as IBS-OBS is also an important tool in offset determination.

Appendix

Appendix – Periods now released.

StartTime	EndTime	Comment
02/10/2021 13:00	02/10/2021 15:00	SC interference
02/10/2021 19:00	03/10/2021 00:00	SC interference
11/10/2021 02:02	11/10/2021 02:04	SC interference
30/10/2021 13:01	30/10/2021 13:04	SC interference
31/10/2021 00:06	31/10/2021 00:12	SC interference

Appendix B: Released files

Filename
solo_L2_mag-rtn-burst_20211001_V02.cdf
solo_L2_mag-rtn-burst_20211002_V02.cdf
solo_L2_mag-rtn-burst_20211003_V02.cdf
solo_L2_mag-rtn-burst_20211004_V02.cdf
solo_L2_mag-rtn-burst_20211005_V02.cdf
solo_L2_mag-rtn-burst_20211006_V02.cdf
solo_L2_mag-rtn-burst_20211007_V02.cdf
solo_L2_mag-rtn-burst_20211008_V02.cdf
solo_L2_mag-rtn-burst_20211009_V02.cdf
solo_L2_mag-rtn-burst_20211010_V02.cdf
solo_L2_mag-rtn-burst_20211011_V02.cdf
solo_L2_mag-rtn-burst_20211012_V02.cdf
solo_L2_mag-rtn-burst_20211013_V02.cdf
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solo_L2_mag-rtn-burst_20211016_V02.cdf
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solo_L2_mag-rtn-burst_20211024_V02.cdf
solo_L2_mag-rtn-burst_20211025_V02.cdf
solo_L2_mag-rtn-burst_20211026_V02.cdf
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