Imperial College London

MAG Data Release Report 2205

02 Nov 2022 (report covers data release for 1-31 May 2022)

Report Version	1	L2 ground processing software version:	V2.21
MAG PI	Tim Horbury t.horbury@imperial.ac.uk		
MAG IM	Helen O'Brien h.obrien@imperial.ac.uk		

Data Summary

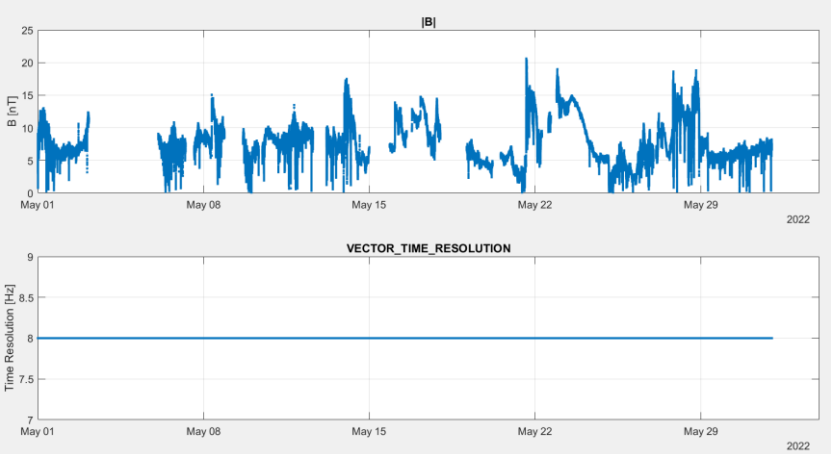
MAG was on for the period 1-31 May 2022.

Spacecraft noise was observed particularly in IBS data for several periods (there was significant noise for a total of 193 hours in the period 1-31 May 2022). 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 4th and 5th of May 2022 cannot be released: SC noise was high for the whole day.

The spacecraft started the month at 0.69AU and on the 31st it was at 0.93AU from the Sun.

Normal Mode

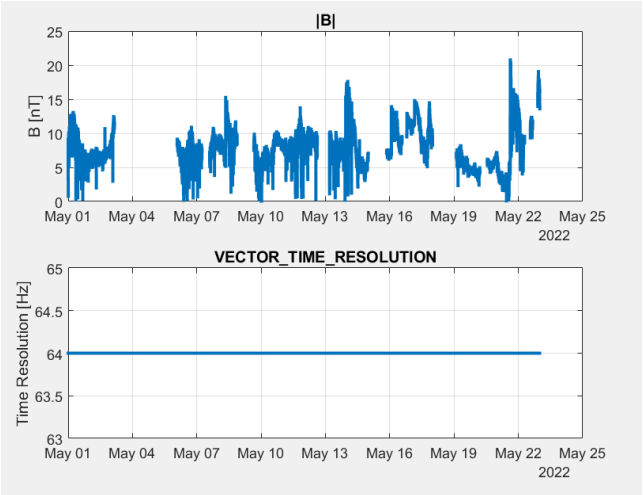


MAG was on with 8Hz cadence normal mode data returned, for exceptions see below.

Operations	1-31 May	Science phase throughout period, normal data returned
Operational Events of Note	None	

Data Gaps greater than one minute:
NaNs have been introduced during the noisiest periods because the data was highly disturbed. See Appendix for details.

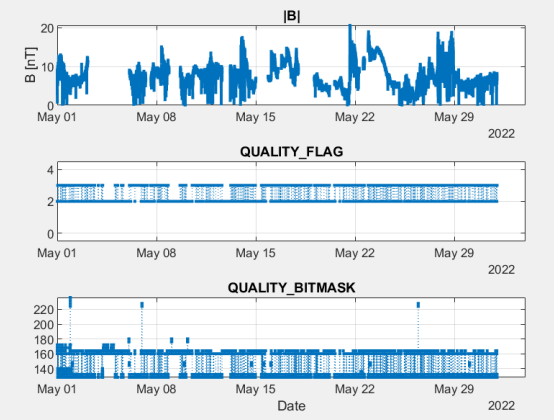
Burst Mode



Coverage is continuous, except for the period when MAG was off.

Coverage	From	To	Coverage
	01/05	22/05	24 hours per day 64 Hz

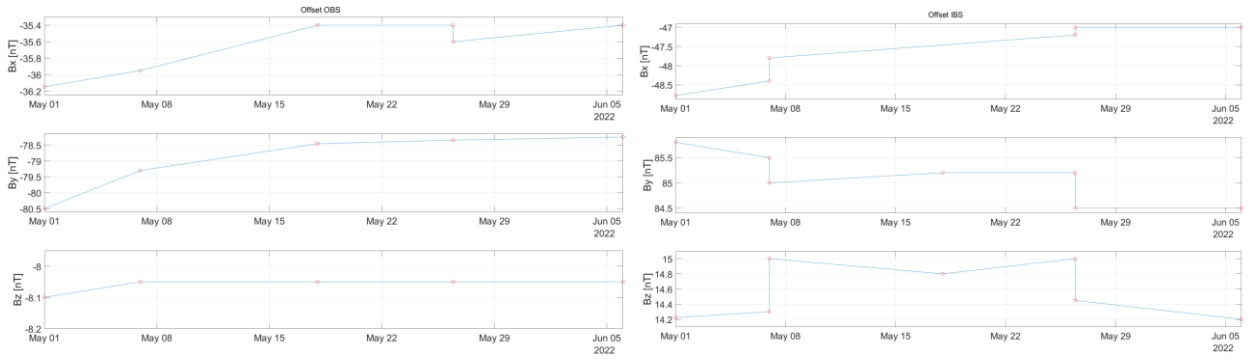
Quality bitmask



Quality bit mask events	
SC events which disturb the field	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
01/05/2022 0957	Solar Array movement from 60 to 56 deg
06/05/2022 23:09	Solar Array movement from 56 to 30 deg
10/05/2022	HGA movement
26/05/2022 10:24	Solar Array movement from 30 to 0 deg

Offset



1-31 May:
The SA movement on 06/05 modified IBS offset, whereas the one on 26/05 modified the offsets of both sensors. OBS offsets linearly recovered throughout the month, decreasing its value since the reboot in April.

Offset	Date	OBSX	OBSY	OBSZ	IBSX	IBSY	IBSZ	Comment
20220327	25/04/2022 00:00	-36.50	-81.50	-8.4	-48.9	86	14.3	Post battery top up event
20220328	27/04/2022 22:45	-36.50		-8.4	-48.9	85.9	14.2	End of linear trend after battery top up event for IBS
20220329	29/04/2022 09:48	-36.40		-8.2				Pre OBS range change from 2 to 3
20220401	29/04/2022 09:48	-36.20		-8.1				Post OBS range change from 2 to 3
20220507	01/05/2022 00:00	-36.15	-80.50	-8.1	-48.78	85.80	14.22	Offset correction for data set up to 30 Apr
20220330	06/05/2022 23:09				-48.4	85.5	14.3	Pre SA movement from 56 to 30 deg
20220402	06/05/2022 23:13	-35.95	-79.30	-8.05	-47.8	85	15	Post SA movement from 56 to 30 deg
20220501	18/05/2022 00:00	-35.40	-78.46	-8.05		85.2	14.8	Change linear trends OBS
20220502	26/05/2022 10:24	-35.40		-8.05	-47.2	85.2	15	Pre SA movement from 30 to 0 deg
20220504	26/05/2022 10:29	-35.60	-78.35	-8.05	-47	84.5	14.45	Post SA movement from 30 to 0 deg
20220504	07/06/2022 00:00	-35.40	-78.2	-8	-47	84.5	14.3	Pre battery top up event

Appendix

Appendix A: NANs periods of the month

This table shows the NaN periods which have been introduced in the data due to SC interference. The disturbance observed in the IBS-OBS data set is large that we cannot quantify the impact on OBS, therefore we have set this data to NaN. If you have a need to see this data, please get in contact with the MAG team and we can discuss this with you.

StartTime	EndTime	Comment
01/05/2022 09:57	01/05/2022 09:58	SA movement from 60 to 56 deg
03/05/2022 03:50	06/05/2022 02:00	SC interference
06/05/2022 23:09	06/05/2022 23:13	SA movement from 56 to 30 deg

07/05/2022 05:50	07/05/2022 14:20	SC interference
08/05/2022 21:15	09/05/2022 15:50	SC interference
10/05/2022 08:00	10/05/2022 11:30	SC interference
12/05/2022 15:00	13/05/2022 04:30	SC interference
15/05/2022 00:00	15/05/2022 20:30	SC interference
16/05/2022 13:50	16/05/2022 19:00	SC interference
18/05/2022 00:00	19/05/2022 02:30	SC interference
20/05/2022 05:00	20/05/2022 13:00	SC interference
22/05/2022 07:00	22/05/2022 13:20	SC interference
22/05/2022 16:00	22/05/2022 21:40	SC interference
26/05/2022 10:24	26/05/2022 10:29	SA movement from 30 to 0 deg
27/05/2022 00:00	27/05/2022 02:30	SC interference
27/05/2022 05:30	27/05/2022 07:15	SC interference
27/05/2022 10:30	27/05/2022 11:15	SC interference
27/05/2022 14:00	27/05/2022 15:30	SC interference

Appendix B: Files within this release

Filename
solo_L2_mag-rtn-burst_20220501_V01.cdf
solo_L2_mag-rtn-burst_20220502_V01.cdf
solo_L2_mag-rtn-burst_20220503_V01.cdf
solo_L2_mag-rtn-burst_20220506_V01.cdf
solo_L2_mag-rtn-burst_20220507_V01.cdf
solo_L2_mag-rtn-burst_20220508_V01.cdf
solo_L2_mag-rtn-burst_20220509_V01.cdf
solo_L2_mag-rtn-burst_20220510_V01.cdf
solo_L2_mag-rtn-burst_20220511_V01.cdf
solo_L2_mag-rtn-burst_20220512_V01.cdf
solo_L2_mag-rtn-burst_20220513_V01.cdf
solo_L2_mag-rtn-burst_20220514_V01.cdf
solo_L2_mag-rtn-burst_20220515_V01.cdf
solo_L2_mag-rtn-burst_20220516_V01.cdf
solo_L2_mag-rtn-burst_20220517_V01.cdf
solo_L2_mag-rtn-burst_20220518_V01.cdf
solo_L2_mag-rtn-burst_20220519_V01.cdf
solo_L2_mag-rtn-burst_20220520_V01.cdf
solo_L2_mag-rtn-burst_20220521_V01.cdf
solo_L2_mag-rtn-burst_20220522_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220501_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220502_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220503_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220506_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220507_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220508_V01.cdf

solo_L2_mag-rtn-normal-1-minute_20220509_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220510_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220511_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220512_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220513_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220514_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220515_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220516_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220517_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220518_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220519_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220520_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220521_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220522_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220523_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220524_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220525_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220526_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220527_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220528_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220529_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220530_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220531_V01.cdf
solo_L2_mag-rtn-normal_20220501_V01.cdf
solo_L2_mag-rtn-normal_20220502_V01.cdf
solo_L2_mag-rtn-normal_20220503_V01.cdf
solo_L2_mag-rtn-normal_20220506_V01.cdf
solo_L2_mag-rtn-normal_20220507_V01.cdf
solo_L2_mag-rtn-normal_20220508_V01.cdf
solo_L2_mag-rtn-normal_20220509_V01.cdf
solo_L2_mag-rtn-normal_20220510_V01.cdf
solo_L2_mag-rtn-normal_20220511_V01.cdf
solo_L2_mag-rtn-normal_20220512_V01.cdf
solo_L2_mag-rtn-normal_20220513_V01.cdf
solo_L2_mag-rtn-normal_20220514_V01.cdf
solo_L2_mag-rtn-normal_20220515_V01.cdf
solo_L2_mag-rtn-normal_20220516_V01.cdf
solo_L2_mag-rtn-normal_20220517_V01.cdf
solo_L2_mag-rtn-normal_20220518_V01.cdf
solo_L2_mag-rtn-normal_20220519_V01.cdf
solo_L2_mag-rtn-normal_20220520_V01.cdf
solo_L2_mag-rtn-normal_20220521_V01.cdf
solo_L2_mag-rtn-normal_20220522_V01.cdf
solo_L2_mag-rtn-normal_20220523_V01.cdf

solo_L2_mag-rtn-normal_20220524_V01.cdf
solo_L2_mag-rtn-normal_20220525_V01.cdf
solo_L2_mag-rtn-normal_20220526_V01.cdf
solo_L2_mag-rtn-normal_20220527_V01.cdf
solo_L2_mag-rtn-normal_20220528_V01.cdf
solo_L2_mag-rtn-normal_20220529_V01.cdf
solo_L2_mag-rtn-normal_20220530_V01.cdf
solo_L2_mag-rtn-normal_20220531_V01.cdf
solo_L2_mag-srf-burst_20220501_V01.cdf
solo_L2_mag-srf-burst_20220502_V01.cdf
solo_L2_mag-srf-burst_20220503_V01.cdf
solo_L2_mag-srf-burst_20220506_V01.cdf
solo_L2_mag-srf-burst_20220507_V01.cdf
solo_L2_mag-srf-burst_20220508_V01.cdf
solo_L2_mag-srf-burst_20220509_V01.cdf
solo_L2_mag-srf-burst_20220510_V01.cdf
solo_L2_mag-srf-burst_20220511_V01.cdf
solo_L2_mag-srf-burst_20220512_V01.cdf
solo_L2_mag-srf-burst_20220513_V01.cdf
solo_L2_mag-srf-burst_20220514_V01.cdf
solo_L2_mag-srf-burst_20220515_V01.cdf
solo_L2_mag-srf-burst_20220516_V01.cdf
solo_L2_mag-srf-burst_20220517_V01.cdf
solo_L2_mag-srf-burst_20220518_V01.cdf
solo_L2_mag-srf-burst_20220519_V01.cdf
solo_L2_mag-srf-burst_20220520_V01.cdf
solo_L2_mag-srf-burst_20220521_V01.cdf
solo_L2_mag-srf-burst_20220522_V01.cdf
solo_L2_mag-srf-normal_20220501_V01.cdf
solo_L2_mag-srf-normal_20220502_V01.cdf
solo_L2_mag-srf-normal_20220503_V01.cdf
solo_L2_mag-srf-normal_20220506_V01.cdf
solo_L2_mag-srf-normal_20220507_V01.cdf
solo_L2_mag-srf-normal_20220508_V01.cdf
solo_L2_mag-srf-normal_20220509_V01.cdf
solo_L2_mag-srf-normal_20220510_V01.cdf
solo_L2_mag-srf-normal_20220511_V01.cdf
solo_L2_mag-srf-normal_20220512_V01.cdf
solo_L2_mag-srf-normal_20220513_V01.cdf
solo_L2_mag-srf-normal_20220514_V01.cdf
solo_L2_mag-srf-normal_20220515_V01.cdf
solo_L2_mag-srf-normal_20220516_V01.cdf
solo_L2_mag-srf-normal_20220517_V01.cdf
solo_L2_mag-srf-normal_20220518_V01.cdf

solo_L2_mag-srf-normal_20220519_V01.cdf
solo_L2_mag-srf-normal_20220520_V01.cdf
solo_L2_mag-srf-normal_20220521_V01.cdf
solo_L2_mag-srf-normal_20220522_V01.cdf
solo_L2_mag-srf-normal_20220523_V01.cdf
solo_L2_mag-srf-normal_20220524_V01.cdf
solo_L2_mag-srf-normal_20220525_V01.cdf
solo_L2_mag-srf-normal_20220526_V01.cdf
solo_L2_mag-srf-normal_20220527_V01.cdf
solo_L2_mag-srf-normal_20220528_V01.cdf
solo_L2_mag-srf-normal_20220529_V01.cdf
solo_L2_mag-srf-normal_20220530_V01.cdf
solo_L2_mag-srf-normal_20220531_V01.cdf