



28 May 2024 (report covers data release for 1-31 Jan 2022)

Report Version	2	L2 ground processing software version:	V2.26.1
MAG PI	Tim Horbury t.horbury@imperial.ac.uk		
MAG IM	Helen O'Brien h.obrien@imperial.ac.uk		

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 January 2022.

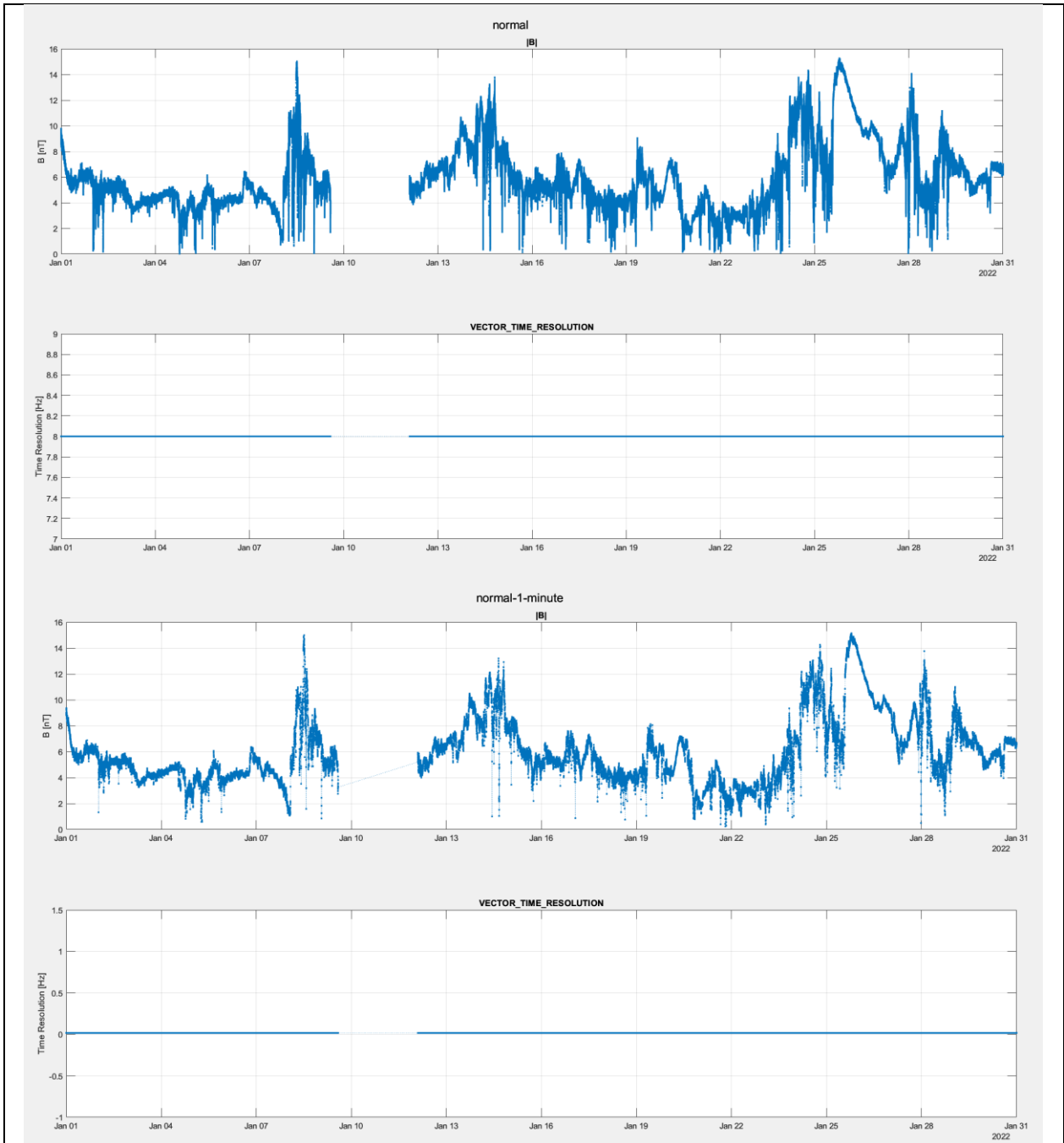
No MAG data available from the 09/01/22 14:00 to 12/01/22 02:20 due to SSMM ASW upgrade.

Spacecraft noise was observed particularly in IBS data for several periods (there was significant noise for a total of 180 hours in the period 1-31 Jan). 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.

13,15,18,31 January 2022 cannot be released because the data have been all converted to NaNs.

The spacecraft started the month at 1.00AU and ended it at 0.86AU from the Sun.

Normal Mode



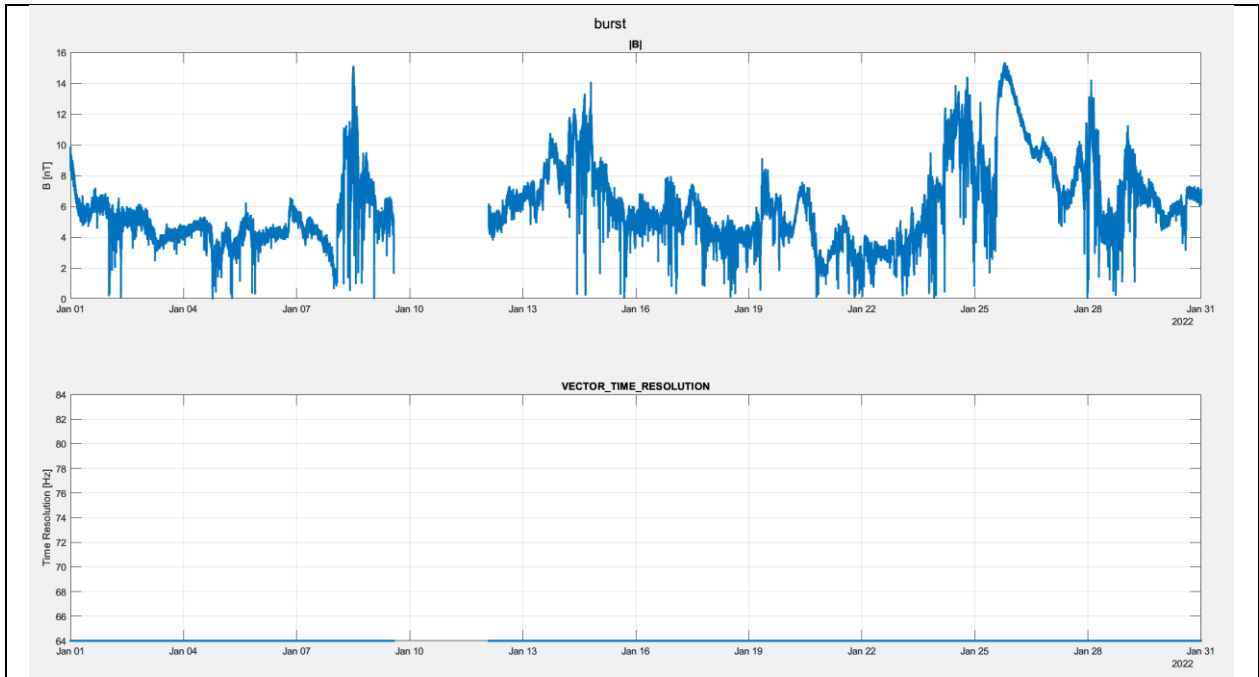
MAG was on with 8Hz cadence normal mode data returned, for exceptions see below.

Operations	1-31 January	Cruise phase throughout period, normal data returned
Operational Events of Note	SSMM ASW upgrade: no MAG data available from the 09/01/22 14:00 to 12/01/22 02:20	

Data Gaps greater than one minute:

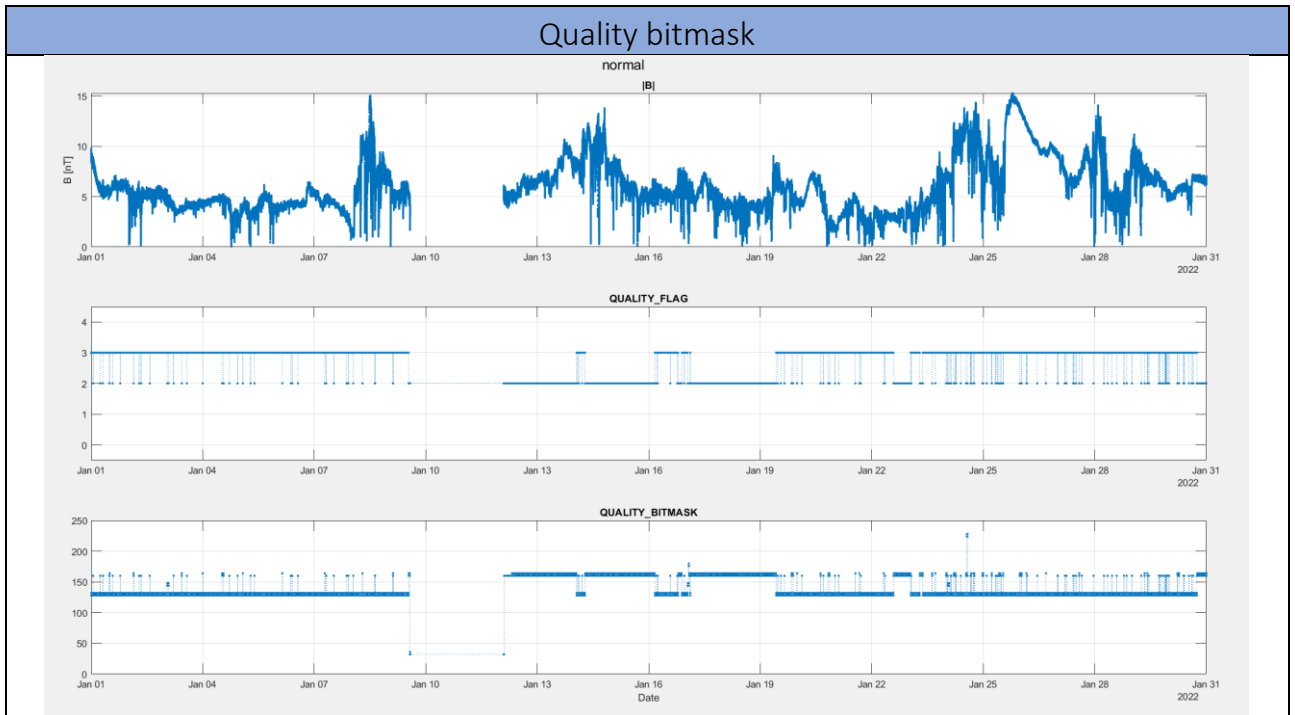
NaNs have been introduced during the noisiest periods because the data was highly disturbed. See Appendix for details.

Burst Mode



No MAG data available from the 09/01/22 14:00 to 12/01/22 02:20 due to SSMM ASW upgrade.

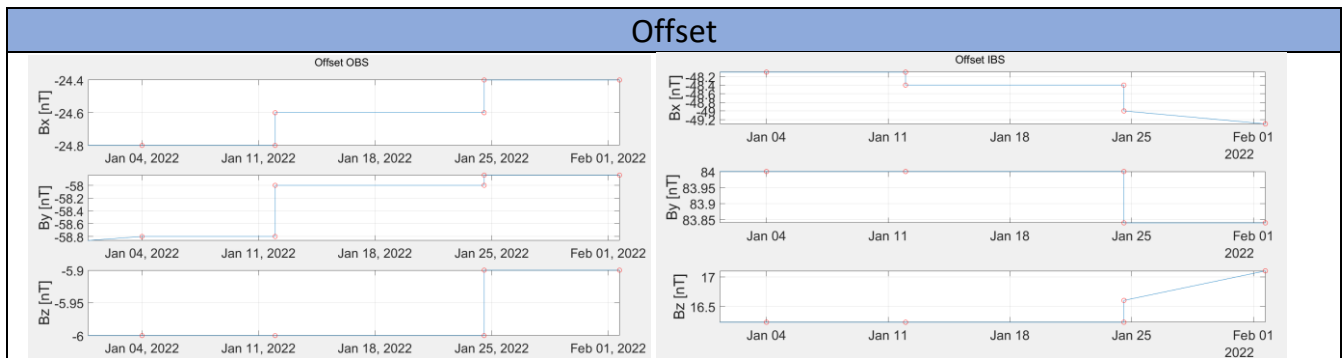
Coverage	From	To	Coverage
	1/01	30/01	24 hours per day 64 Hz
	31/01	31/01	24 hours per day 128 Hz



Quality bit mask events

SC events which	<ol style="list-style-type: none"> 1. Thruster firings 2. Solar array lubrications (solar array is moved 15 degrees, then returned to original position)
-----------------	--

disturb the field	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
	17/01/22 16:30-17:10	SA movement
	24/01/22 13:20-13:25	SA movement
	31/01/22 00:05	Battery top up event



1-31 January:

OBS By continued recovering after the reboot on the 20th of September 2021, linearly moving closer to zero. The linear trend momentarily stopped on the 4th of Jan, but it continued afterwards. OBS, as well as IBS, was affected by SSMM ASW software upgrade: the offset changed when MAG turned ON again on the 12th of Jan. The SA movement on the 24th of Jan modified the offset of both sensors.

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

Offset	Date	OBSX	OBSY	OBSZ	IBSX	IBSY	IBSZ	Comment
220101	14/12/2021 15:00	-24.8	-59.2	-6	-48.1	84	16.23	TCM end
220102	04/01/2022 00:00	-24.8	-58.8	-6	-48.1	84	16.23	
220102	12/01/2022 00:00	-24.8	-58.8	-6	-48.1	84	16.23	MAG turn OFF
220103	12/01/2022 00:00	-24.6	-58	-6	-48.4	84	16.23	MAG turn ON
220103	24/01/2022 13:20	-24.6	-58	-6	-48.4	84	16.23	Pre SA movement from 0 to 30 deg
220104	24/01/2022 13:25	-24.4	-57.84	-5.9	-49	83.84	16.6	Post SA movement from 0 to 30 deg
220105	01/02/2022 16:36	-24.4	-57.84	-5.9	-49.3	83.84	17.1	Pre IBS range change from 2 to 3
220106	01/02/2022 16:36	-24.3	-57.84	-5.9	-49.3	83.84	17.1	Post IBS range change from 2 to 3

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
04/01/2022 13:02	04/01/2022 13:03	SC interference
09/01/2022 13:00	09/01/2022 14:05	SC interference
12/01/2022 00:00	14/01/2022 01:00	Interference after reboot and SC interference
14/01/2022 07:00	16/01/2022 04:00	SC interference
16/01/2022 19:00	16/01/2022 21:00	SC interference
17/01/2022 03:00	19/01/2022 09:00	SC interference
20/01/2022 20:23	20/01/2022 20:24	SC interference
22/01/2022 14:00	23/01/2022 01:00	SC interference
23/01/2022 07:00	23/01/2022 09:00	SC interference
24/01/2022 13:20	24/01/2022 13:26	SA movement
30/01/2022 18:00	01/02/2022 00:00	SC interference

Appendix B: Files within this release

Filename
solo_L2_mag-rtn-burst_20220101_V01.cdf
solo_L2_mag-rtn-burst_20220102_V01.cdf
solo_L2_mag-rtn-burst_20220103_V01.cdf
solo_L2_mag-rtn-burst_20220104_V01.cdf
solo_L2_mag-rtn-burst_20220105_V01.cdf
solo_L2_mag-rtn-burst_20220106_V01.cdf
solo_L2_mag-rtn-burst_20220107_V01.cdf
solo_L2_mag-rtn-burst_20220108_V01.cdf
solo_L2_mag-rtn-burst_20220109_V01.cdf
solo_L2_mag-rtn-burst_20220112_V01.cdf
solo_L2_mag-rtn-burst_20220114_V01.cdf
solo_L2_mag-rtn-burst_20220116_V01.cdf
solo_L2_mag-rtn-burst_20220117_V01.cdf

solo_L2_mag-rtn-burst_20220119_V01.cdf
solo_L2_mag-rtn-burst_20220120_V01.cdf
solo_L2_mag-rtn-burst_20220121_V01.cdf
solo_L2_mag-rtn-burst_20220122_V01.cdf
solo_L2_mag-rtn-burst_20220123_V01.cdf
solo_L2_mag-rtn-burst_20220124_V01.cdf
solo_L2_mag-rtn-burst_20220125_V01.cdf
solo_L2_mag-rtn-burst_20220126_V01.cdf
solo_L2_mag-rtn-burst_20220127_V01.cdf
solo_L2_mag-rtn-burst_20220128_V01.cdf
solo_L2_mag-rtn-burst_20220129_V01.cdf
solo_L2_mag-rtn-burst_20220130_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220101_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220102_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220103_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220104_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220105_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220106_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220107_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220108_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220109_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220112_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220114_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220116_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220117_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220119_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220120_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220121_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220122_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220123_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220124_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220125_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220126_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220127_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220128_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220129_V01.cdf
solo_L2_mag-rtn-normal-1-minute_20220130_V01.cdf
solo_L2_mag-rtn-normal_20220101_V01.cdf
solo_L2_mag-rtn-normal_20220102_V01.cdf
solo_L2_mag-rtn-normal_20220103_V01.cdf
solo_L2_mag-rtn-normal_20220104_V01.cdf
solo_L2_mag-rtn-normal_20220105_V01.cdf
solo_L2_mag-rtn-normal_20220106_V01.cdf
solo_L2_mag-rtn-normal_20220107_V01.cdf
solo_L2_mag-rtn-normal_20220108_V01.cdf
solo_L2_mag-rtn-normal_20220109_V01.cdf

solo_L2_mag-rtn-normal_20220112_V01.cdf
solo_L2_mag-rtn-normal_20220114_V01.cdf
solo_L2_mag-rtn-normal_20220116_V01.cdf
solo_L2_mag-rtn-normal_20220117_V01.cdf
solo_L2_mag-rtn-normal_20220119_V01.cdf
solo_L2_mag-rtn-normal_20220120_V01.cdf
solo_L2_mag-rtn-normal_20220121_V01.cdf
solo_L2_mag-rtn-normal_20220122_V01.cdf
solo_L2_mag-rtn-normal_20220123_V01.cdf
solo_L2_mag-rtn-normal_20220124_V01.cdf
solo_L2_mag-rtn-normal_20220125_V01.cdf
solo_L2_mag-rtn-normal_20220126_V01.cdf
solo_L2_mag-rtn-normal_20220127_V01.cdf
solo_L2_mag-rtn-normal_20220128_V01.cdf
solo_L2_mag-rtn-normal_20220129_V01.cdf
solo_L2_mag-rtn-normal_20220130_V01.cdf
solo_L2_mag-srf-burst-cdag_20220101_V02.cdf
solo_L2_mag-srf-burst-cdag_20220102_V02.cdf
solo_L2_mag-srf-burst-cdag_20220103_V02.cdf
solo_L2_mag-srf-burst-cdag_20220104_V02.cdf
solo_L2_mag-srf-burst-cdag_20220105_V02.cdf
solo_L2_mag-srf-burst-cdag_20220106_V02.cdf
solo_L2_mag-srf-burst-cdag_20220107_V02.cdf
solo_L2_mag-srf-burst-cdag_20220108_V02.cdf
solo_L2_mag-srf-burst-cdag_20220109_V02.cdf
solo_L2_mag-srf-burst-cdag_20220112_V02.cdf
solo_L2_mag-srf-burst-cdag_20220114_V02.cdf
solo_L2_mag-srf-burst-cdag_20220116_V02.cdf
solo_L2_mag-srf-burst-cdag_20220117_V02.cdf
solo_L2_mag-srf-burst-cdag_20220119_V02.cdf
solo_L2_mag-srf-burst-cdag_20220120_V02.cdf
solo_L2_mag-srf-burst-cdag_20220121_V02.cdf
solo_L2_mag-srf-burst-cdag_20220122_V02.cdf
solo_L2_mag-srf-burst-cdag_20220123_V02.cdf
solo_L2_mag-srf-burst-cdag_20220124_V02.cdf
solo_L2_mag-srf-burst-cdag_20220125_V02.cdf
solo_L2_mag-srf-burst-cdag_20220126_V02.cdf
solo_L2_mag-srf-burst-cdag_20220127_V02.cdf
solo_L2_mag-srf-burst-cdag_20220128_V02.cdf
solo_L2_mag-srf-burst-cdag_20220129_V02.cdf
solo_L2_mag-srf-burst-cdag_20220130_V02.cdf
solo_L2_mag-srf-burst_20220101_V01.cdf
solo_L2_mag-srf-burst_20220102_V01.cdf
solo_L2_mag-srf-burst_20220103_V01.cdf
solo_L2_mag-srf-burst_20220104_V01.cdf
solo_L2_mag-srf-burst_20220105_V01.cdf

solo_L2_mag-srf-burst_20220106_V01.cdf
solo_L2_mag-srf-burst_20220107_V01.cdf
solo_L2_mag-srf-burst_20220108_V01.cdf
solo_L2_mag-srf-burst_20220109_V01.cdf
solo_L2_mag-srf-burst_20220112_V01.cdf
solo_L2_mag-srf-burst_20220114_V01.cdf
solo_L2_mag-srf-burst_20220116_V01.cdf
solo_L2_mag-srf-burst_20220117_V01.cdf
solo_L2_mag-srf-burst_20220119_V01.cdf
solo_L2_mag-srf-burst_20220120_V01.cdf
solo_L2_mag-srf-burst_20220121_V01.cdf
solo_L2_mag-srf-burst_20220122_V01.cdf
solo_L2_mag-srf-burst_20220123_V01.cdf
solo_L2_mag-srf-burst_20220124_V01.cdf
solo_L2_mag-srf-burst_20220125_V01.cdf
solo_L2_mag-srf-burst_20220126_V01.cdf
solo_L2_mag-srf-burst_20220127_V01.cdf
solo_L2_mag-srf-burst_20220128_V01.cdf
solo_L2_mag-srf-burst_20220129_V01.cdf
solo_L2_mag-srf-burst_20220130_V01.cdf
solo_L2_mag-srf-normal-cdag_20220101_V02.cdf
solo_L2_mag-srf-normal-cdag_20220102_V02.cdf
solo_L2_mag-srf-normal-cdag_20220103_V02.cdf
solo_L2_mag-srf-normal-cdag_20220104_V02.cdf
solo_L2_mag-srf-normal-cdag_20220105_V02.cdf
solo_L2_mag-srf-normal-cdag_20220106_V02.cdf
solo_L2_mag-srf-normal-cdag_20220107_V02.cdf
solo_L2_mag-srf-normal-cdag_20220108_V02.cdf
solo_L2_mag-srf-normal-cdag_20220109_V02.cdf
solo_L2_mag-srf-normal-cdag_20220112_V02.cdf
solo_L2_mag-srf-normal-cdag_20220114_V02.cdf
solo_L2_mag-srf-normal-cdag_20220116_V02.cdf
solo_L2_mag-srf-normal-cdag_20220117_V02.cdf
solo_L2_mag-srf-normal-cdag_20220119_V02.cdf
solo_L2_mag-srf-normal-cdag_20220120_V02.cdf
solo_L2_mag-srf-normal-cdag_20220121_V02.cdf
solo_L2_mag-srf-normal-cdag_20220122_V02.cdf
solo_L2_mag-srf-normal-cdag_20220123_V02.cdf
solo_L2_mag-srf-normal-cdag_20220124_V02.cdf
solo_L2_mag-srf-normal-cdag_20220125_V02.cdf
solo_L2_mag-srf-normal-cdag_20220126_V02.cdf
solo_L2_mag-srf-normal-cdag_20220127_V02.cdf
solo_L2_mag-srf-normal-cdag_20220128_V02.cdf
solo_L2_mag-srf-normal-cdag_20220129_V02.cdf
solo_L2_mag-srf-normal-cdag_20220130_V02.cdf
solo_L2_mag-srf-normal_20220101_V01.cdf

solo_L2_mag-srf-normal_20220102_V01.cdf
solo_L2_mag-srf-normal_20220103_V01.cdf
solo_L2_mag-srf-normal_20220104_V01.cdf
solo_L2_mag-srf-normal_20220105_V01.cdf
solo_L2_mag-srf-normal_20220106_V01.cdf
solo_L2_mag-srf-normal_20220107_V01.cdf
solo_L2_mag-srf-normal_20220108_V01.cdf
solo_L2_mag-srf-normal_20220109_V01.cdf
solo_L2_mag-srf-normal_20220112_V01.cdf
solo_L2_mag-srf-normal_20220114_V01.cdf
solo_L2_mag-srf-normal_20220116_V01.cdf
solo_L2_mag-srf-normal_20220117_V01.cdf
solo_L2_mag-srf-normal_20220119_V01.cdf
solo_L2_mag-srf-normal_20220120_V01.cdf
solo_L2_mag-srf-normal_20220121_V01.cdf
solo_L2_mag-srf-normal_20220122_V01.cdf
solo_L2_mag-srf-normal_20220123_V01.cdf
solo_L2_mag-srf-normal_20220124_V01.cdf
solo_L2_mag-srf-normal_20220125_V01.cdf
solo_L2_mag-srf-normal_20220126_V01.cdf
solo_L2_mag-srf-normal_20220127_V01.cdf
solo_L2_mag-srf-normal_20220128_V01.cdf
solo_L2_mag-srf-normal_20220129_V01.cdf
solo_L2_mag-srf-normal_20220130_V01.cdf