Verification and validation of Swarm L1b FAST products

Ingo Michaelis, Martin Rother, Jan Rauberg, Guram Kervalishvili, Monika Korte

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SWARM DISC

(Swarm **D**ata, **I**nnovation, and **S**cience **C**luster) is an international consortium to enhance the scientific return of the Swarm satellite mission. One of the tasks of the Swarm DISC includes identifying, selecting and running new Swarm products and services; also, including products from other Low Earth Orbit (LEO) missions whose data supports the Swarm mission objectives.

SWARM FAST L1B DATA

From November 2023, some datasets can be obtained more quickly for space weather monitoring purposes through the "FAST" processing chain in contrast to the standard "Operational" chain. Swarm daily Operational L1b and L2 datasets are available with a delay of 3 and 5 days, respectively. FAST (Fast-Track) L1b datasets are available at least 2-times per day: 2 passes per satellite per day. The datasets are available in low resolution (LR, 1 Hz) and high resolution (HR, 50 Hz).

Home ▸ Fast ▸ Level1b

Name

|	
ACCx_PR	MAGx_CA
ASMxAUX	MAGx_HR
EFIx_LP	MAGx_LR
EFIxLPI	MODx_SC
GPSxNAV	SC_xDYN
GPSx_RN	STRxATT
GPSx_RO	VFMxAUX
LP_x_CA	

SWARM A MAGNETIC RESIDUAL

The residuals in the figures below show the **FAST MAGA_LR (a)** and **FAST MAGA_HR (b)** datasets after subtraction of CHAOS7 magnetic model. Each figure has the following panels:
1st panel: FAST dataset – CHAOS7 (chaosmagpy)
2nd panel: OPER dataset – CHAOS7 (ViRES)
3rd panel: FAST dataset – OPER dataset

a)

b)
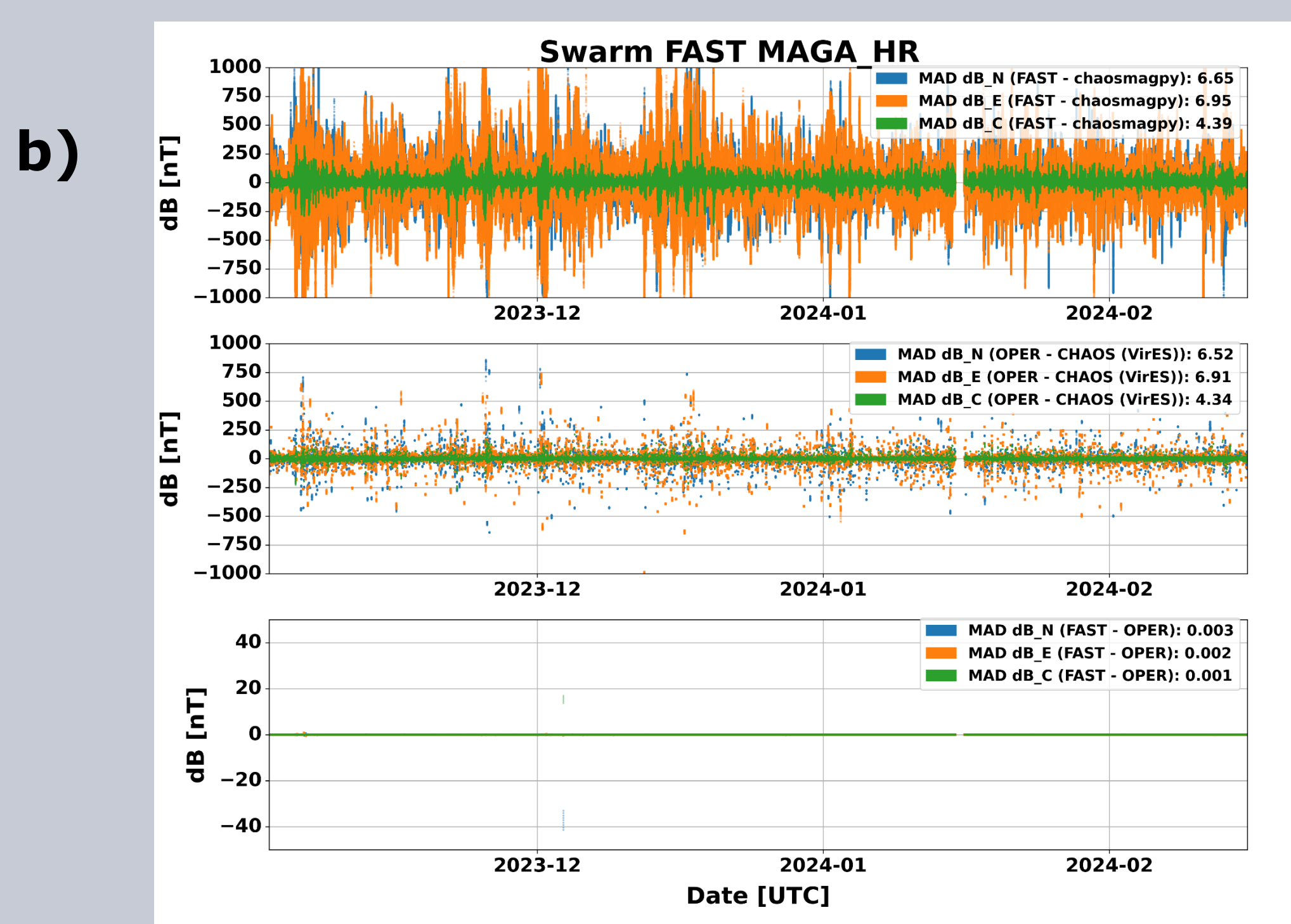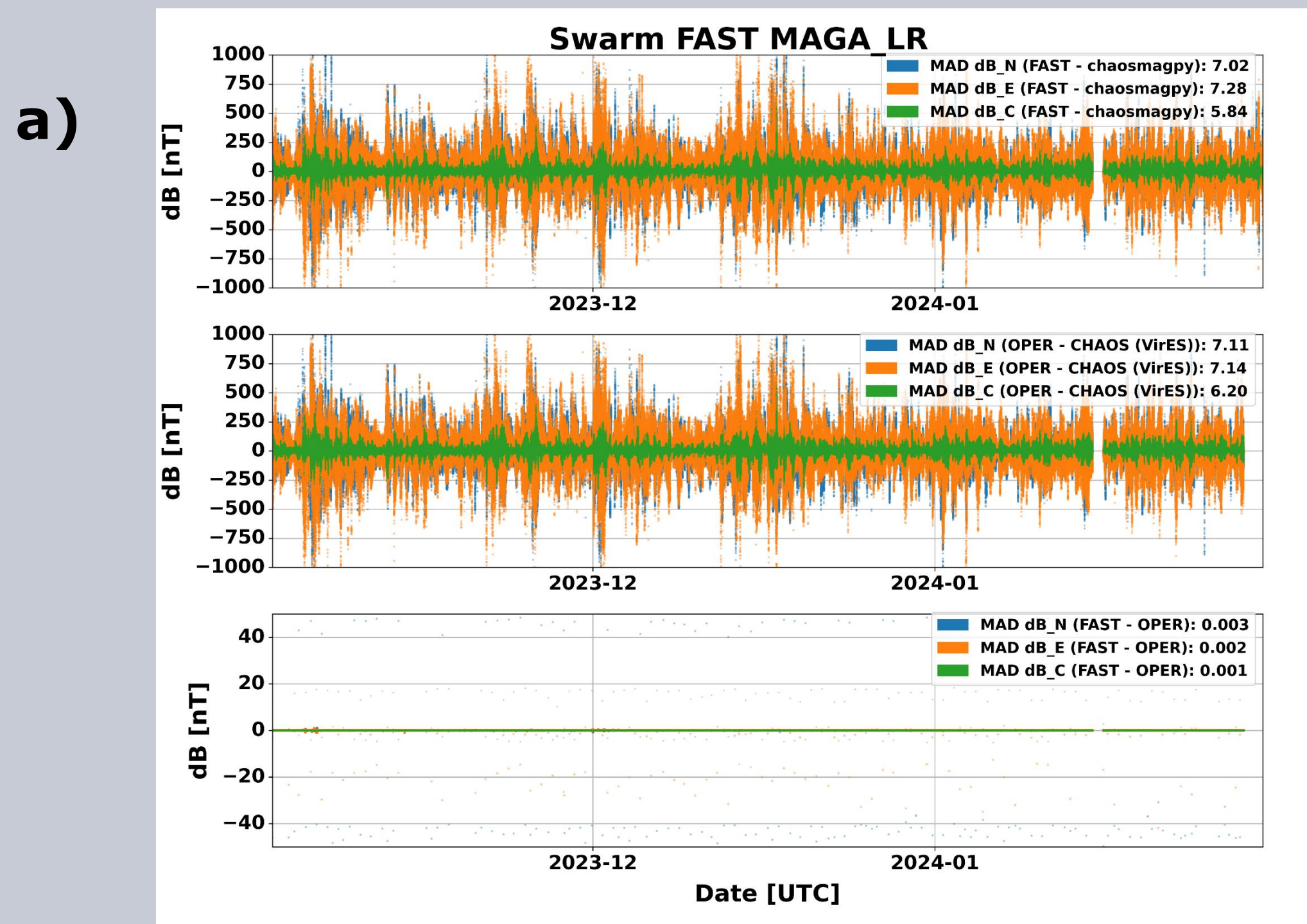
SWARM A, B AND C LATENCY

The figures show the latency for the three Swarm satellites A (top), B (mid) and C (bottom). The "youngest" data are always available after passing Kiruna station (yellow star). Vice versa the data with the largest latency are available at Longitudes at about 0 and 180 which is mainly Western Europe/Africa and the pacific region.
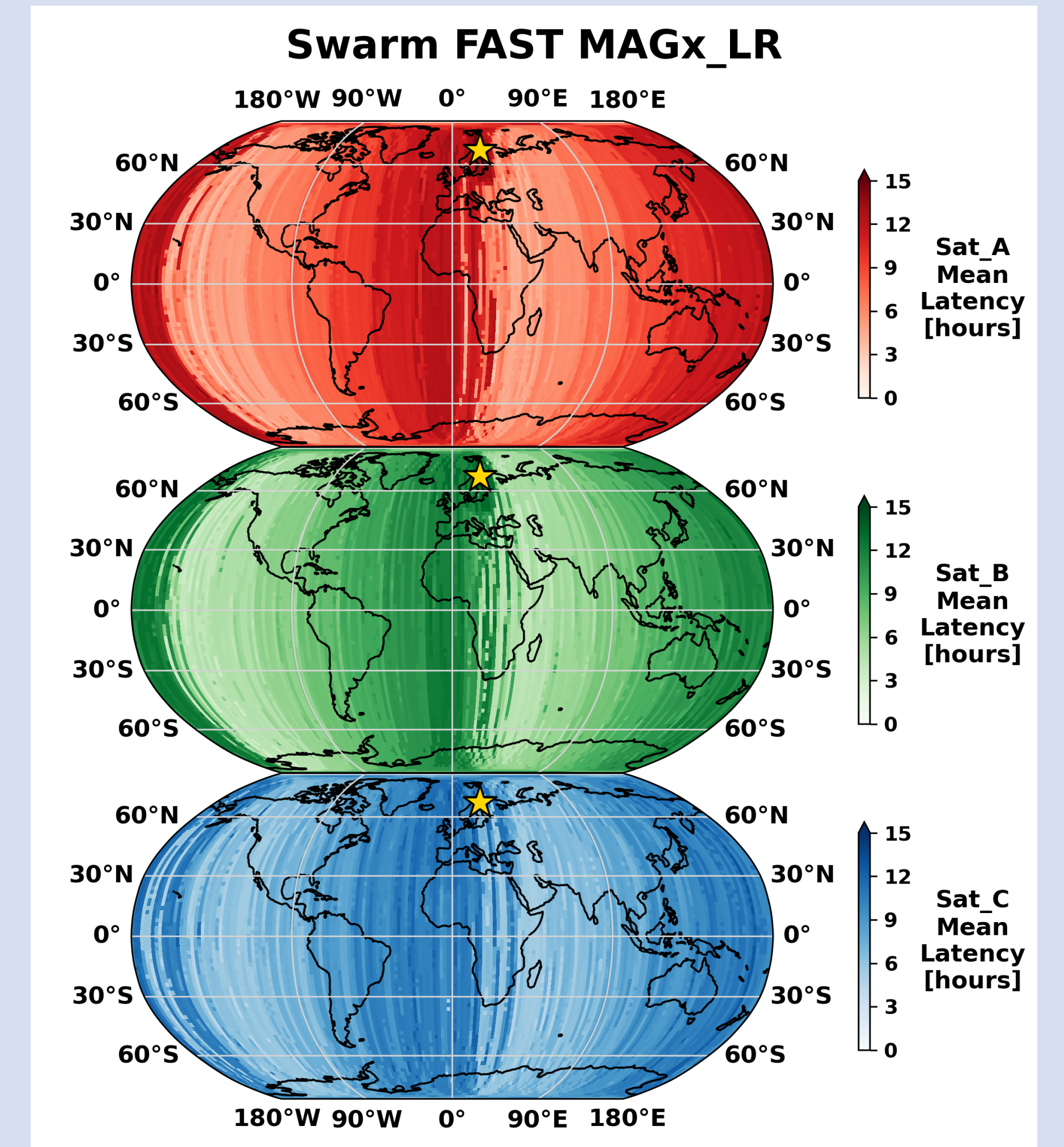
The latest Swarm FAST magnetogram is now available on GFZ website

SWARM A, B AND C STATISTICS

The majority of files shows **more than 95% valid** measurements.
Gaps between subsequent files (inter-file gaps) are in the range of few seconds. There are no files starting with a gap. Swarm A/B have a **10 minute** gap at the end of the files, for Swarm C the gap is about **2 minutes**. The processing takes about **70 minutes**
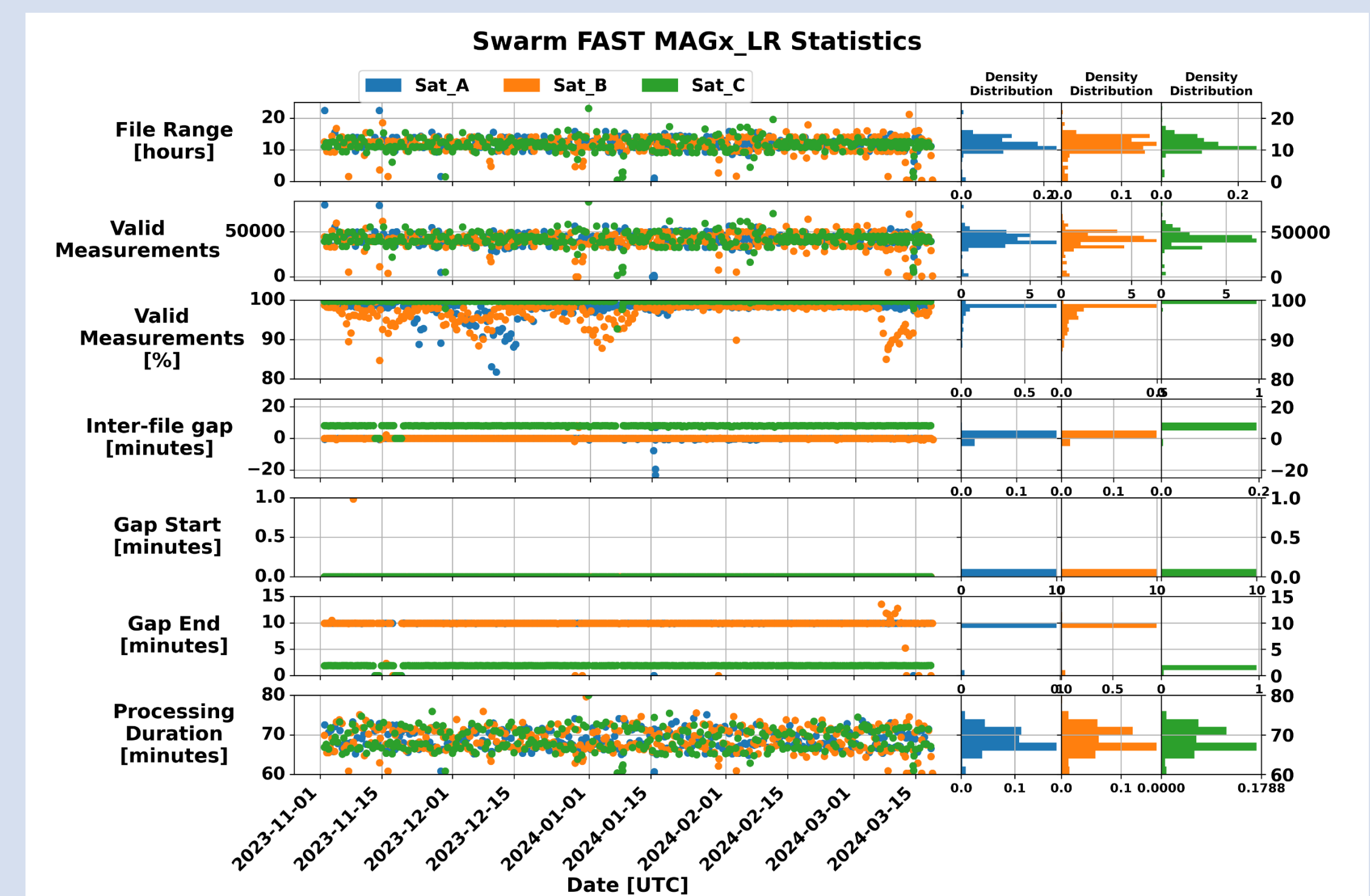
SUMMARY

- Swarm L1b FAST MAG agree well with Swarm L1b OPER MAG for low and high resolution
- The agreement between Swarm L1b OPER MAG and CHAOS (VirES) as well as between FAST and OPER is even better for the high than for the low resolution dataset
- The Swarm L1b FAST datasets are updated twice a day which leads to a latency of about 1.5 to 15 hours

REFERENCES

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