

Two Extravehicular Activity (EVA) Days:

1. GMT 230, 2026-08-18 (14:21-15:24)
2. GMT 237, 2026-08-25 (15:30)

Acceleration Data Observations via **Space Acceleration Measurement System (SAMS)**

**ISS ELOG
notification
cluster**

**5 independent
sensor heads**

**3 ISS
lab modules**

**2 distinctive
spectral
features**

Historical Context:

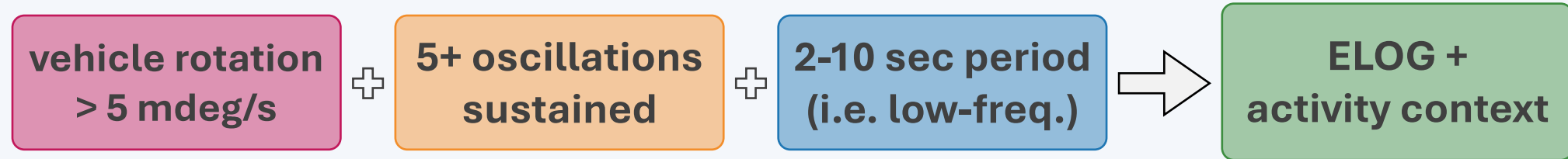
https://gipoc.grc.nasa.gov/pims/pimsdocs/public/ISS%20Handbook/hb_vib_crew_Unusual_Rate_Signature_2014-06-20.pdf

https://gipoc.grc.nasa.gov/pims/pimsdocs/public/ISS%20Handbook/hb_vib_crew_Unusual_Rate_Signature_2024-09-03.pdf

https://gipoc.grc.nasa.gov/pims/pimsdocs/public/ISS%20Handbook/hb_vib_crew_Unusual_Rate_Signature_2024.pdf

Unusual Rate Signature Criteria

Precedent frames the signature as a low-frequency structural response detected by vehicle rotational-rate criteria, then later qualified and quantified with SAMS acceleration data.



- 2014 precedent: SAMS sensors in all 3 labs detected registered the disturbance; JEM saw the largest response.
- 2024 precedent: repeated ~0.19 Hz global structural-mode excitation; stronger response outside the US LAB and primarily Z-axis/XZ-plane.
- acceleration power spectral density (PSD) establishes the frequency content; narrow-band RMS provides an intuitive way to quantify event intensity over time.

previous handbook characterization: qualify via spectrogram (reveal patterns, structures, boundaries) > compare axes and sensor locations > quantify with targeted frequency band energy (narrowband RMS)

Prior handbook examples showed...

SAMS registered “broad” (below 2 Hz) low-frequency structural excitation and multi-sensor/axis consensus.

•	2014	~0.3 Hz prominent at SAMS’ JEM location on Z-axis	
•	2024	~0.19 Hz prominent at SAMS’ COL and JEM locations on YZ-plane	

Common features across recent and previous events:

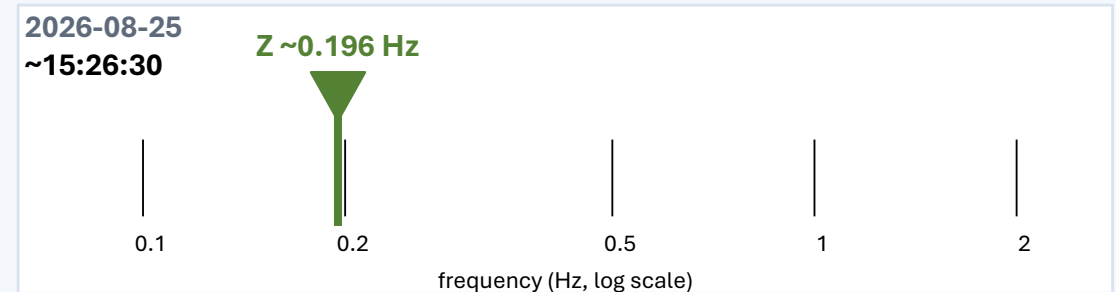
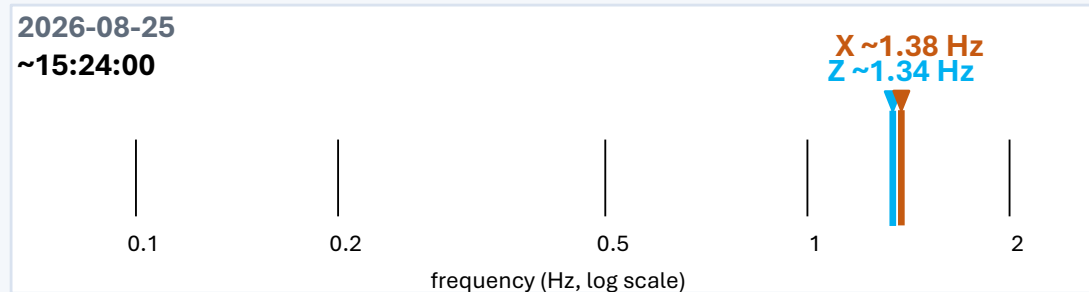
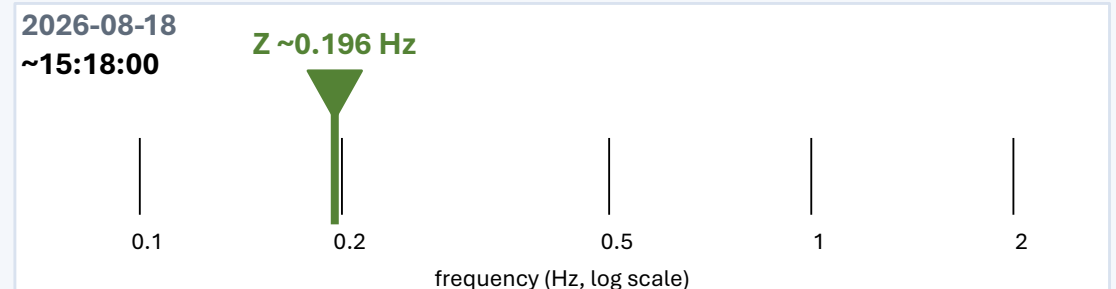
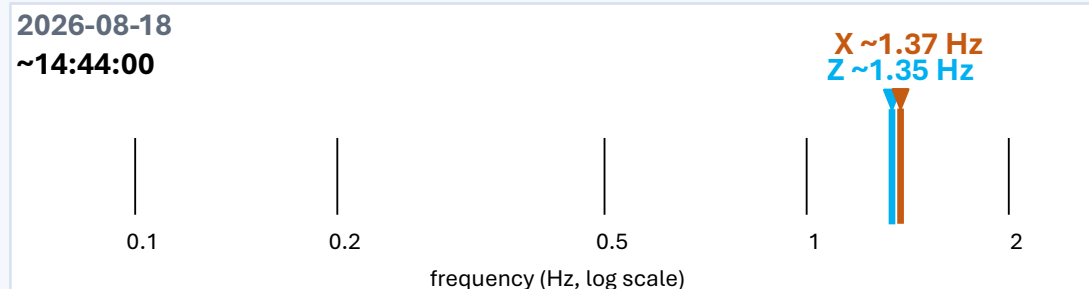
- Low-frequency motion is the central focus as it couples to large station structural mode excitation/resonance.
- Sensor location matters: JEM & Columbus generally show stronger response than US LAB.
- Space Station Analysis (SSA) axis alignment may help interpret the physical direction of the stimulus/response.

Repeatable peaks/excitation appearing across 5 independent heads is generally of interest or more so than a single-location excursion.

Additional Observations from GMT 2026-08-18 & 2026-08-25

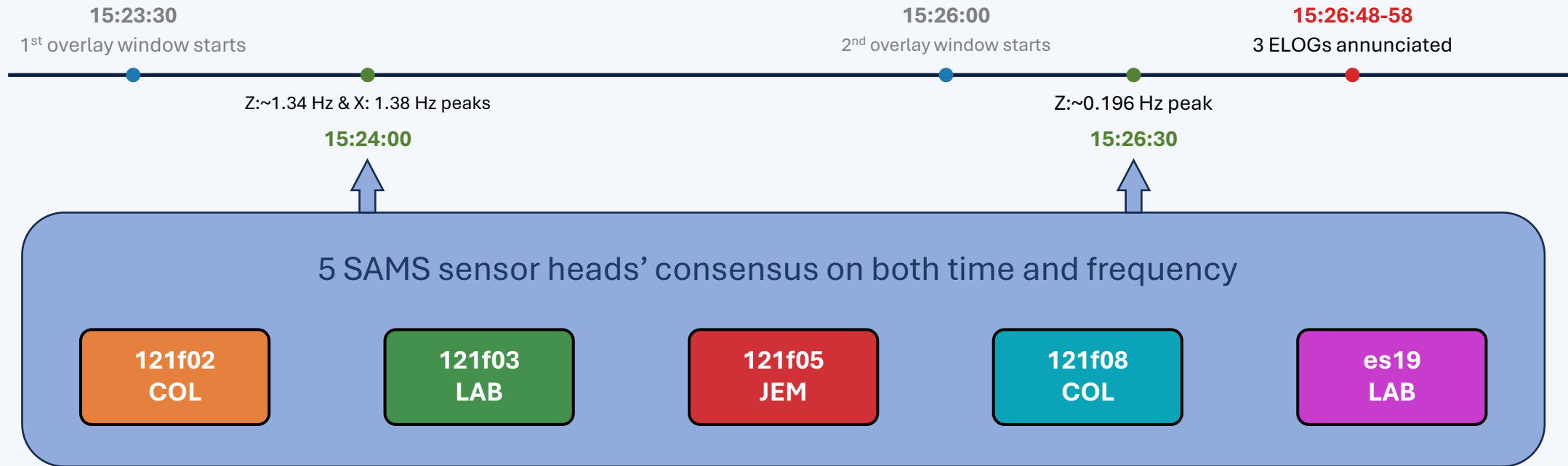
Two key features: “broad” (below 2 Hz) low-frequency structural excitation and multiple, independent sensor consensus.

• 2026-08-18	<i>earlier:</i> X~1.37 Hz, Z~1.35 Hz	<i>later:</i> Z~0.196 Hz
• 2026-08-25	<i>earlier:</i> X~1.38 Hz, Z~1.34 Hz	<i>later:</i> Z~0.196 Hz



Event Context: SGANT EVA Dynamic Operation on GMT 2026-08-25

Three Unusual Rate Signature ELOGs were annunciated during a no-exercise-constraint operation; crew polling was not performed.



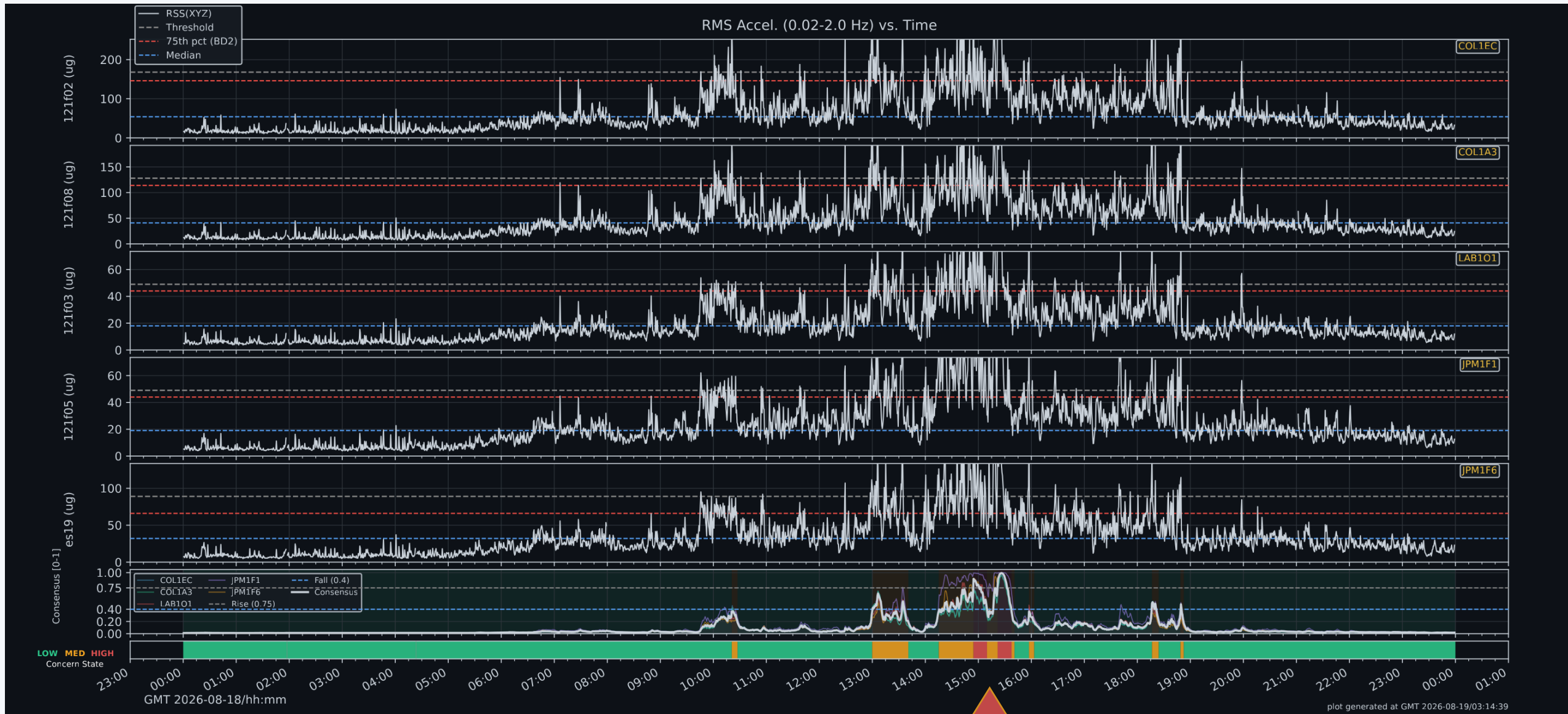
Operational note

Because the operation required a no exercise constraint, MCS 3.401 crew polling was not conducted.

Expected contributors

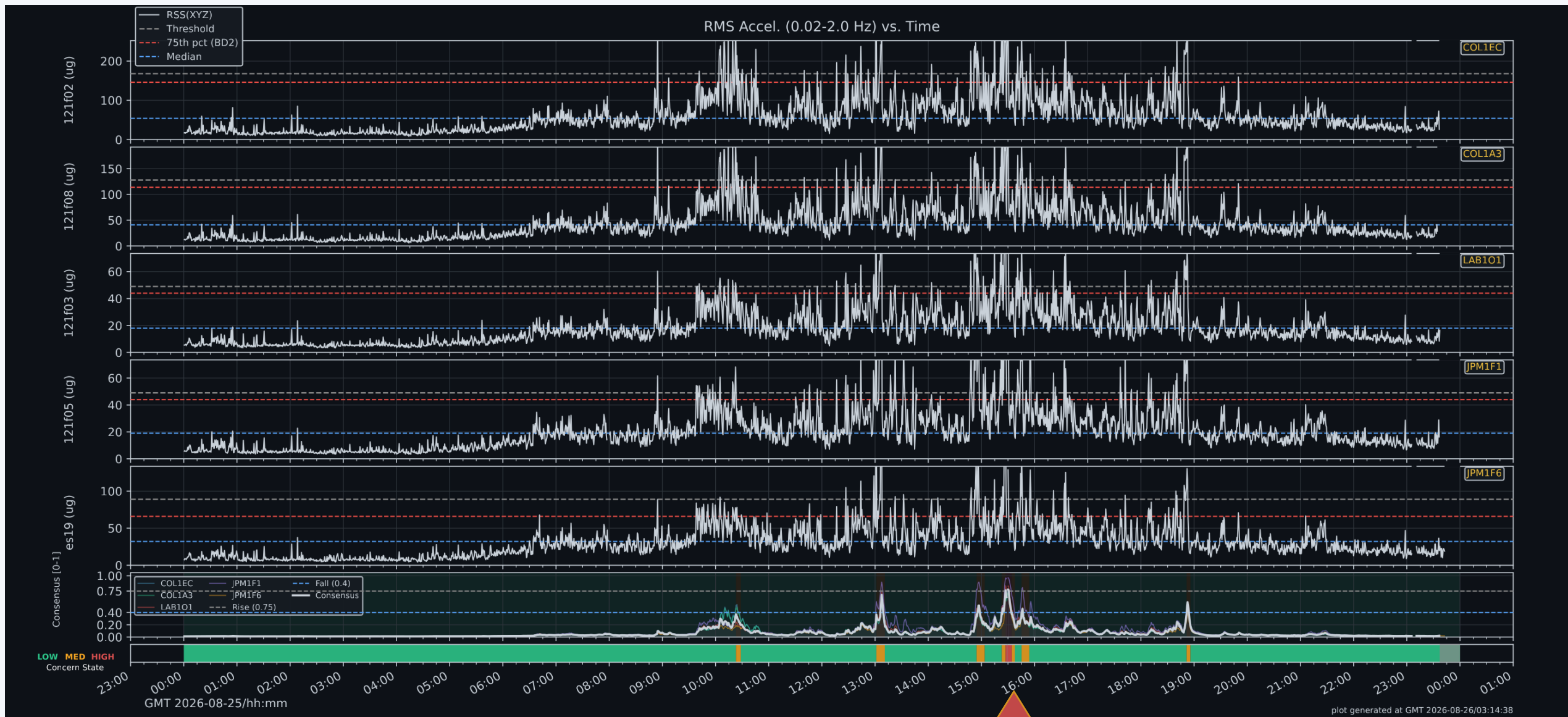
EV-1 movement on the arm near the RGAs, combined with large arm maneuvers throughout the day.

GMT 2026-08-18: RMS Below 2 Hz for 5 SAMS Sensor Heads Vote/Consensus



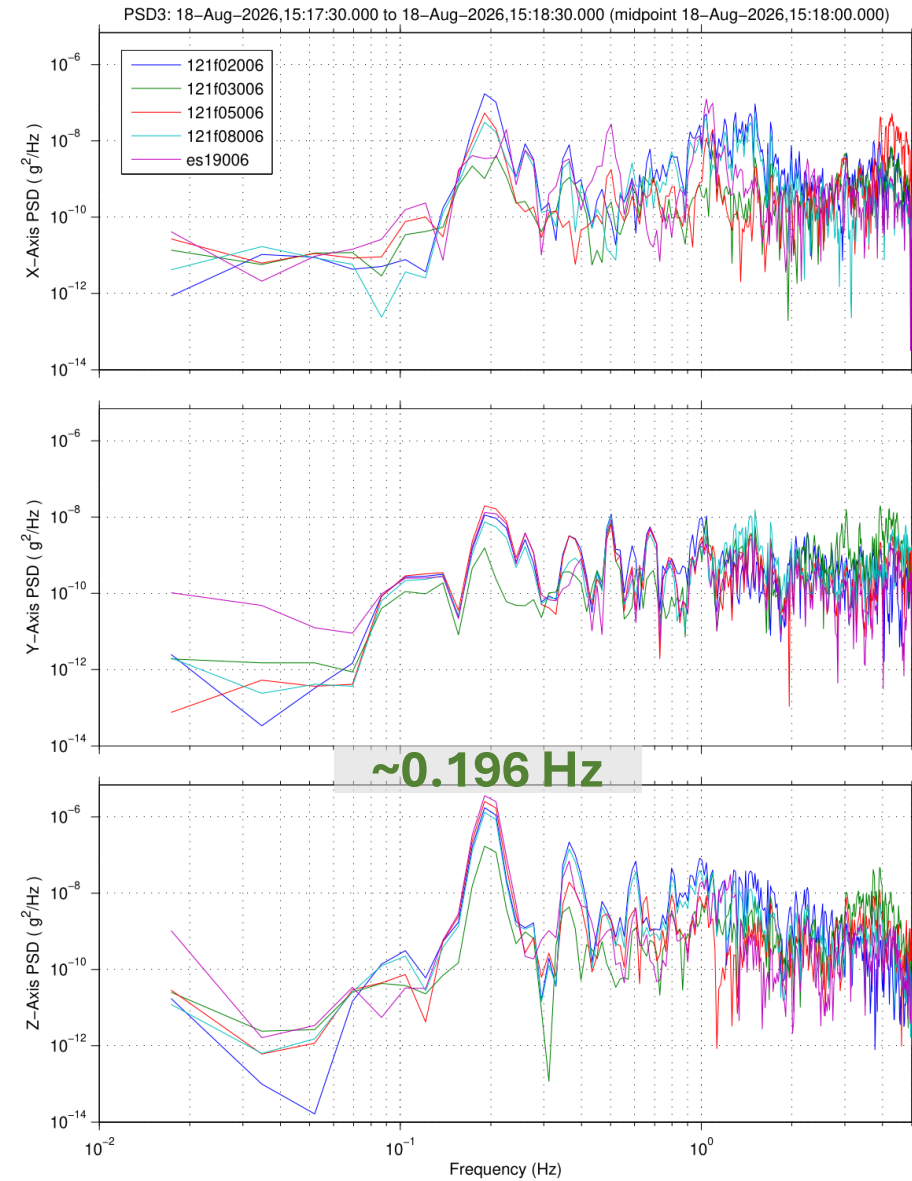
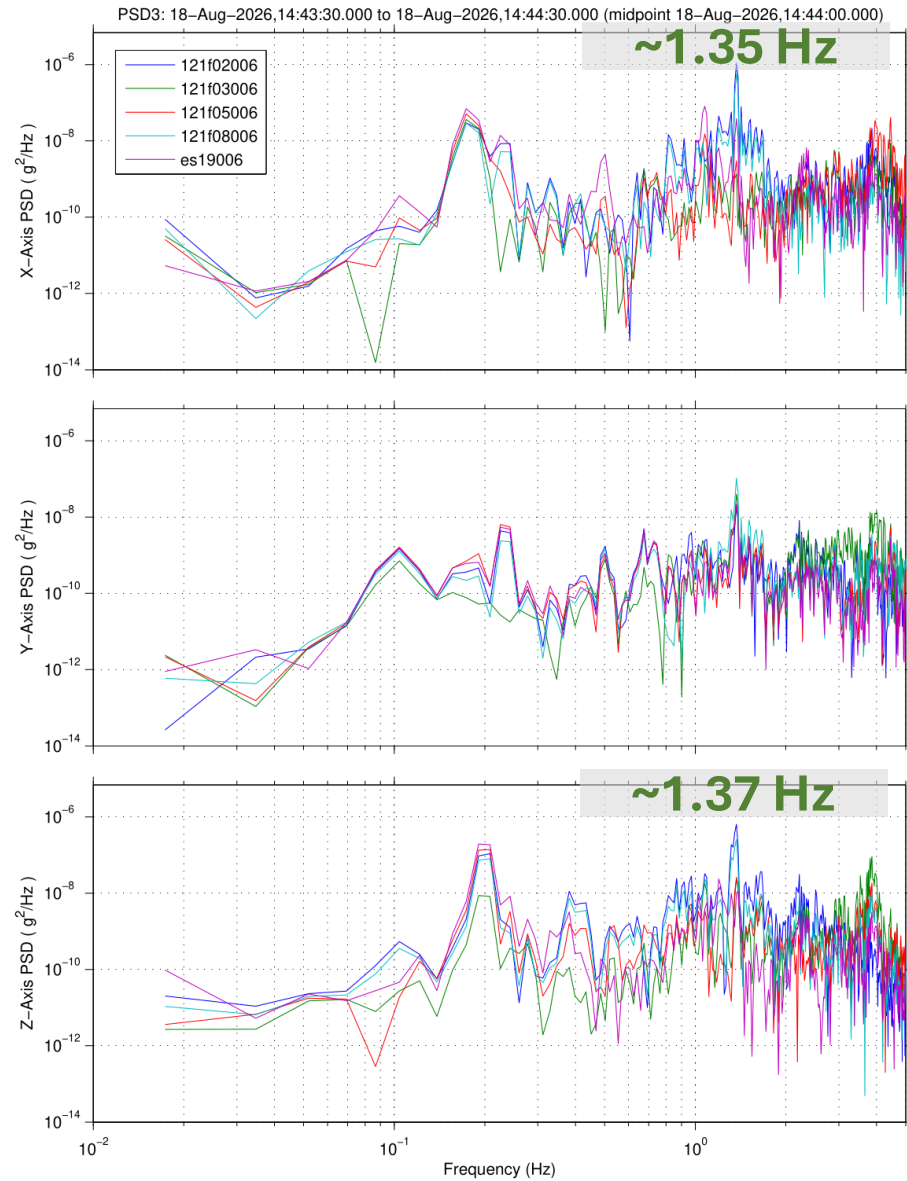
Leaky integration of RMS accel. reveals persistent excitation here.

GMT 2026-08-25: RMS Below 2 Hz for 5 SAMS Sensor Heads Vote/Consensus



~ One week later (from previous slide), less persistent excitation here.

SAMS EVA on GMT 2026-08-18



SAMS EVA on GMT 2026-08-25

