

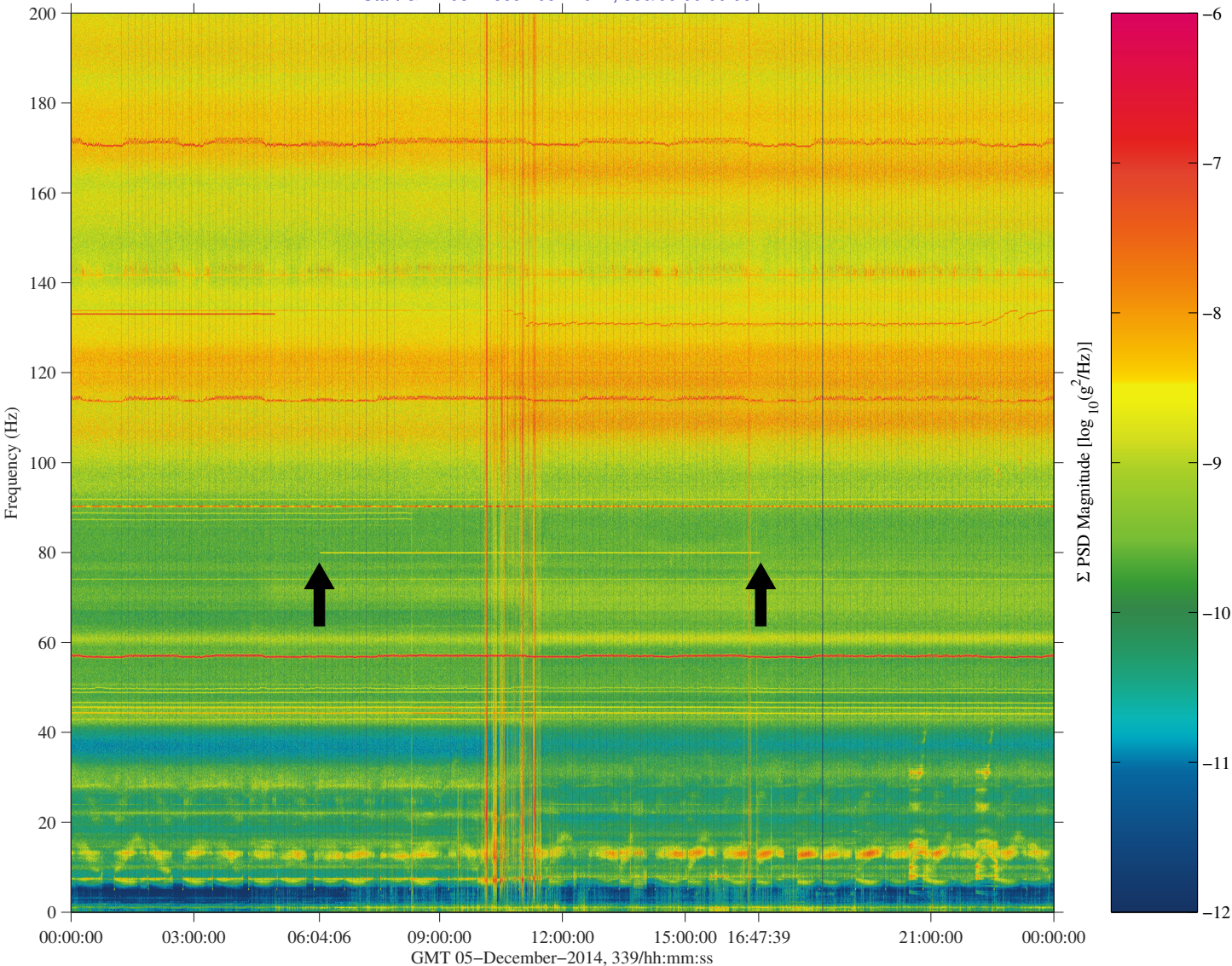
# FROST Stirling Cooler Quality

sams2, 121f05 at JPM1F5, ER4, Drawer 2:[466.80 -292.06 214.58]  
 500.0000 sa/sec (200.00 Hz)  
 Δf = 0.122 Hz, Nfft = 4096  
 Temp. Res. = 8.192 sec, No = 0

sams2, 121f05

Start GMT 05-December-2014, 339/00:00:00.001

Sum  
 Hanning, k = 3515  
 Span = 24 hours



Description	
Sensor	SAMS 121f05 500.0 sa/sec, 200.0 Hz
Location	JPM1F5, ER4, Drawer 2
Plot Type	Spectrogram

### Notes:

- Microgravity data analyst colleagues from JAXA provided information on the operations of the Freezer-Refrigerator Of STirling cycle (FROST).
- The FROST is a -70deg. centigrade Japanese freezer for the JEM on the ISS.
- This information correlated with a vibratory signature at 80 Hz that started in the JEM just after 06:00 on GMT 05-Dec-2014.
- The black arrows on this spectrogram point out that on GMT 05-Dec-2014, the FROST was producing the narrowband 80 Hz signature for over 10 hours from about 06:04:06 to about 16:47:39.

Regime:	Vibratory
Category:	Equipment
Source:	FROST Stirling Cooler



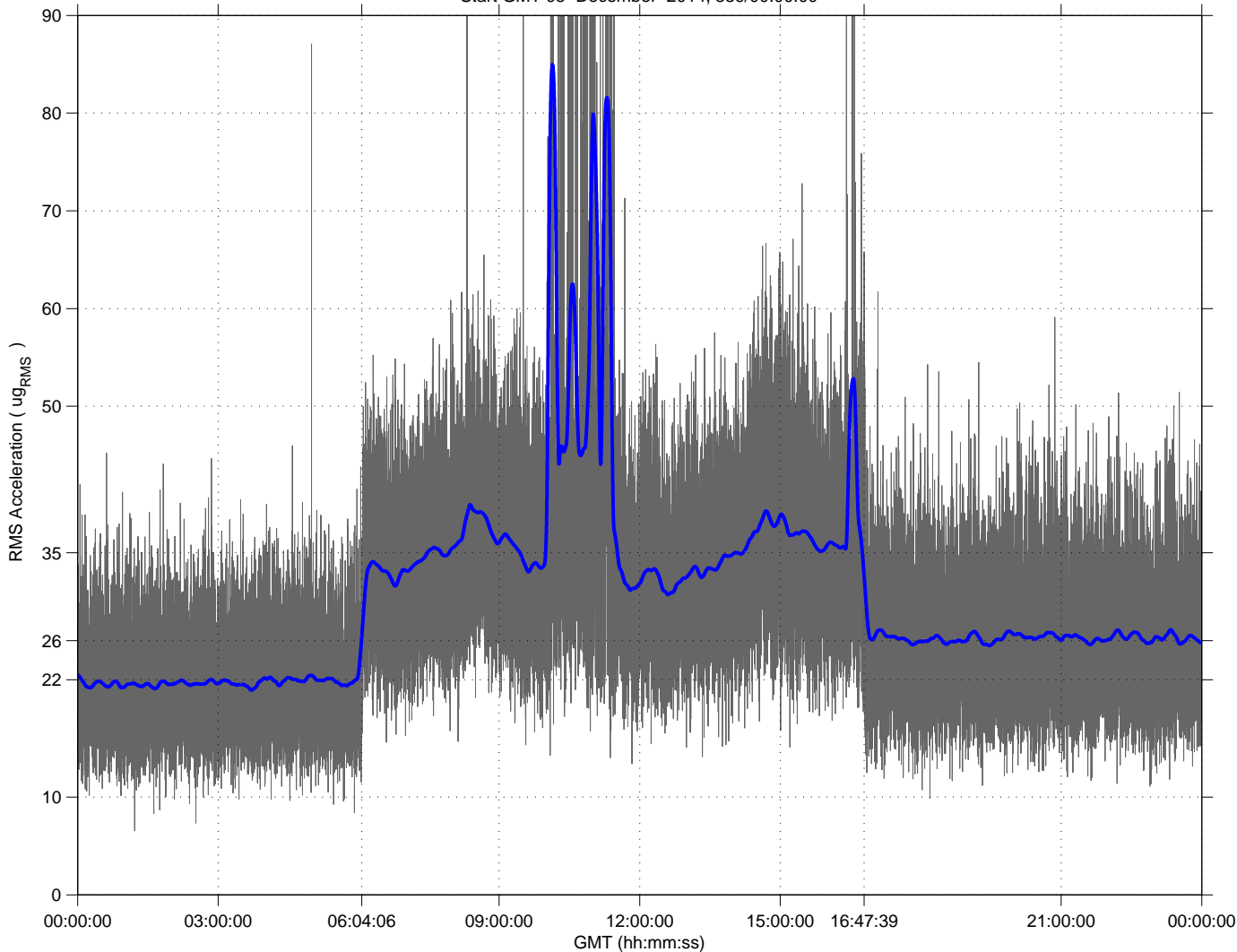
# FROST Stirling Cooler Quantify

sams2, 121f05 at JPM1F5, ER4, Drawer 2[466.80 -292.06 214.58]  
500.0000 sa/sec (200.00 Hz)  
 $\Delta f$ : 0.488 Hz, Range: 79 - 81 Hz  
Temp. Resolution: 2.048 sec

SAMS2, 121f05, JPM1F5, ER4, Drawer 2, 200.0 Hz (500.0 s/sec)

SSAnalysis[ 0.0 0.0 0.0]  
Hanning, k = 1

Start GMT 05-December-2014, 339/00:00:00



## Description

Sensor	SAMS 121f05 500.0 sa/sec, 200.0 Hz
Location	JPM1F5, ER4, Drawer 2
Plot Type	RMS vs. Time

## Notes:

- This plot of RMS versus time serves to better quantify what was observed as the narrowband signature in the spectrogram on the previous page.
- The RMS value plotted versus time was for the frequency range from 79 to 81 Hz.
- The gray trace shows data from the SAMS sensor in the JEM (near JPM1F5) every ~ 2 seconds.
- The blue trace is a smoothed (moving average) of the gray trace, with an average every ~ 17 minutes.
- Note before 06:04:06, the blue trace shows average RMS values at around 22 ug.
- During FROST ops, the average RMS value fluctuated around 35 ug for about 10 hours.
- After FROST ops, starting at about GMT 16:47:39, the average RMS dropped down to about 26 ug, about 4 ug above its pre-FROST baseline.

Regime:	Vibratory
Category:	Equipment
Source:	FROST Stirling Cooler





# About FROST

- The Freezer-Refrigerator Of STirling cycle (FROST) is an active freezer/refrigerator launched on HTV-4. FROST offers cold storage capability in the JEM.
- The FROST was installed at JPM1A7 in Inc36. Checkouts both of freezer/refrigerator modes(-85degC ~ +3degC) have been performed during Inc37/38.

