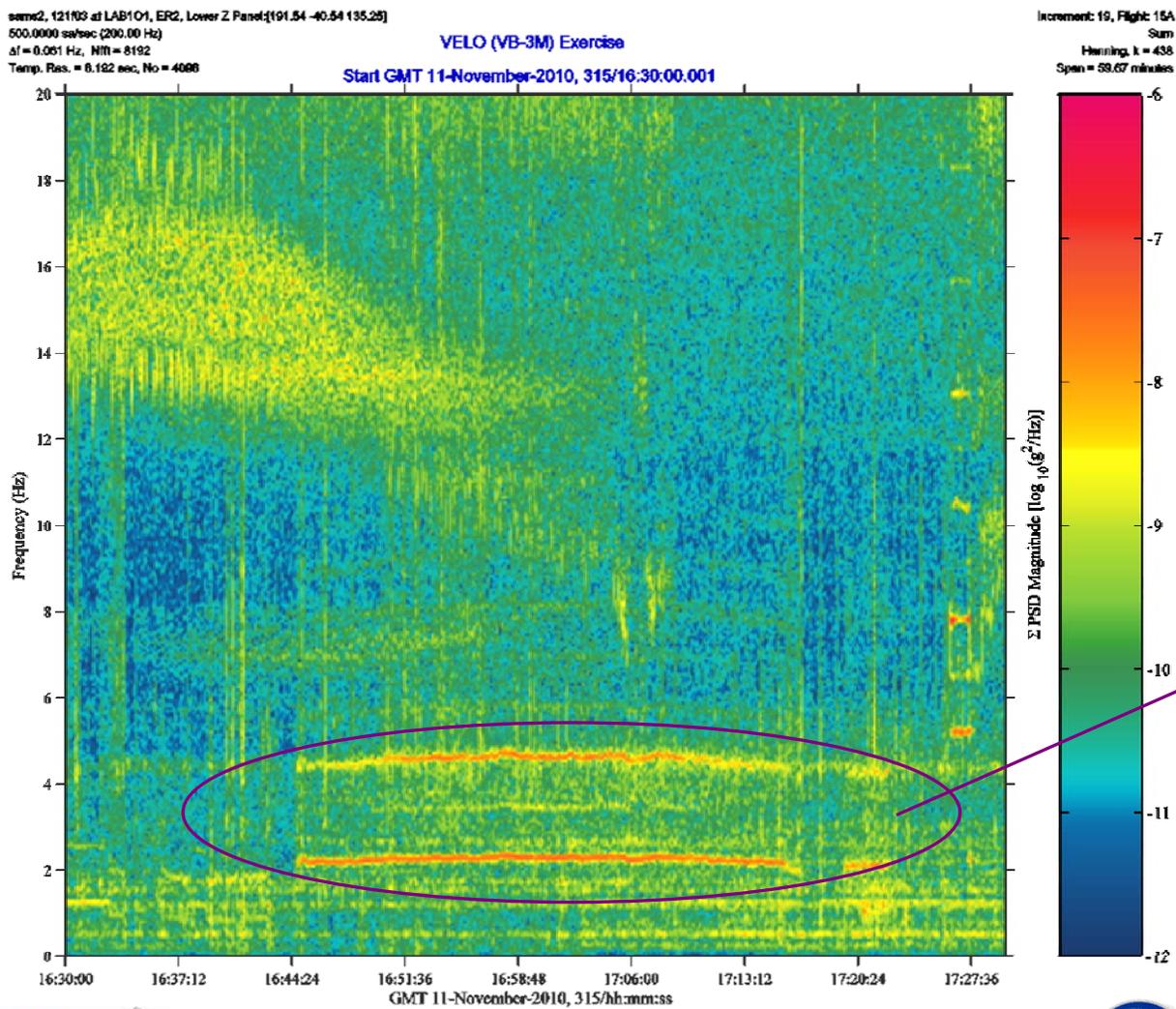


## Velosiped (VELO VB-3M) Qualify



Microgravity Science Division



Glenn Research Center

PIMS ISS Acceleration Handbook  
 Date last modified 12/27/2010

Description	
Sensor	121f03 500.0 sa/sec (200.00 Hz)
Location	LAB101, ER2, Lower Z Panel
Orientation	Space Station Analysis (SSA)
Inc/Flight	Increment: 25, Flight: UF4
Plot Type	Spectrogram

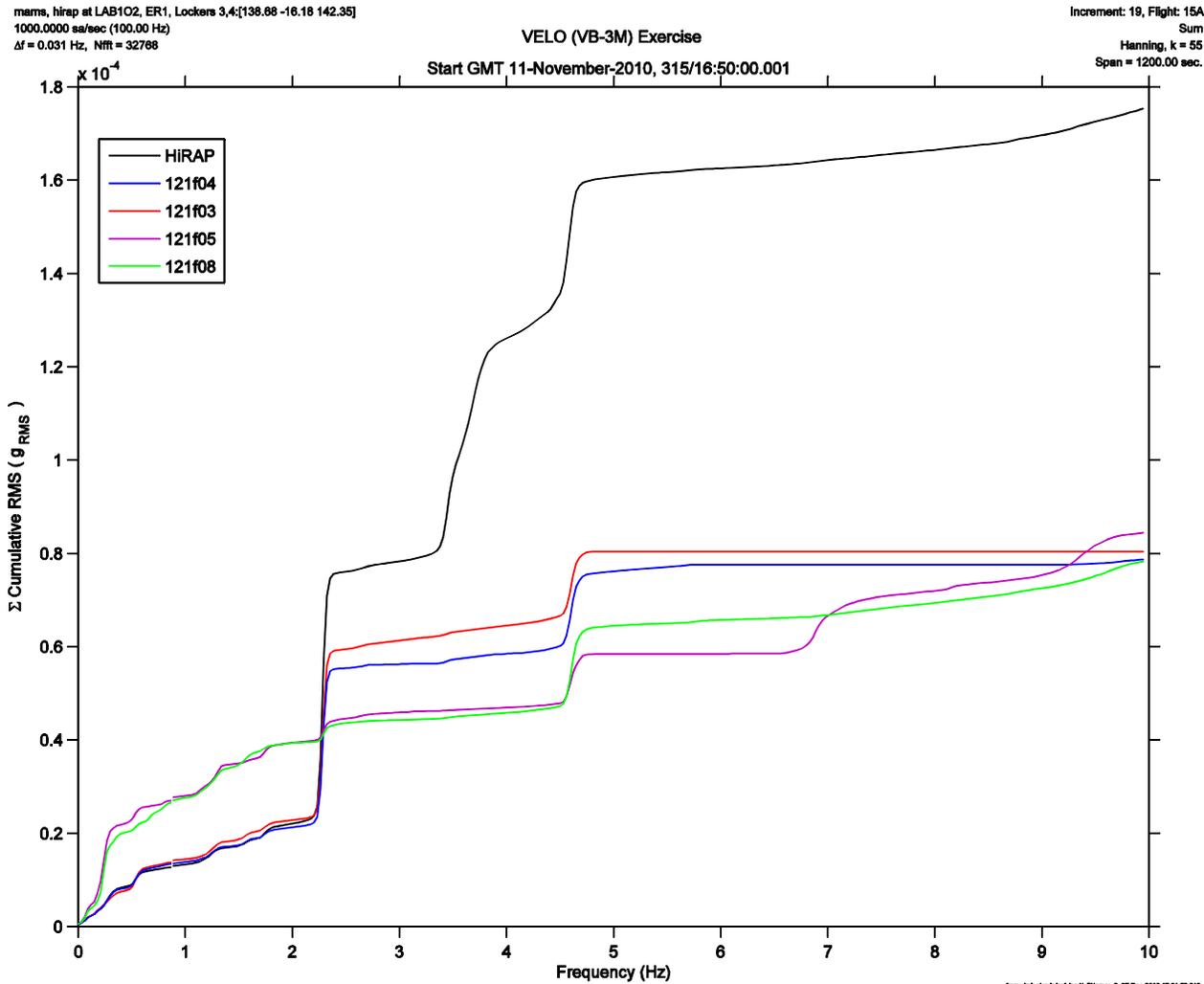
### NOTES:

- The velosiped (VELO) is a Russian bicycle/ergometer exercise device located in the Zvezda service module. On GMT 159/8-Jun-2010 the VELO (VB-3) was replaced with an updated model (VB-3M).
- The spectrogram shows a typical signature for crew exercise on the VELO from approximately 16:44 to 17:20, with a small gap near 17:15.
- For this periods, both the pedal rate signature at about 4.6 Hz and the shoulder sway at half that rate, 2.3 Hz, are evident.
- This signature is also seen on sensors throughout the ISS, which include:

Sensor	Location
121f03	LAB101 (USLAB, structure)
121f04	LAB102 (USLAB, structure)
121f05	JPM1F5 (JEM, rack)
121f08	COL101 (Columbus, rack)
HiRAP	LAB101 (USLAB, rack)

Regime:	Vibratory
Category:	Crew Exercise
Source:	Velosiped (VELO VB-3M)

# Velosiped (VELO VB-3M) Quantify



Description	
Sensor	Multiple Sensors Cutoff of 10.00 Hz
Location	Multiple Locations
Orientation	Space Station Analysis (SSA)
Inc/Flight	Increment:25, Flight: UF4
Plot Type	Cumulative RMS

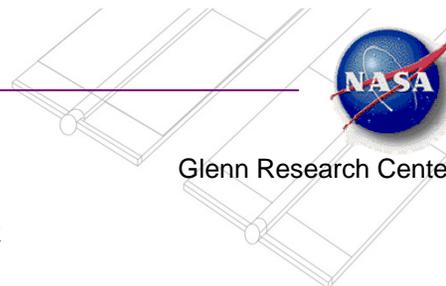
**NOTES:**

- To quantify the impact of VELO exercise, cumulative RMS curves were computer for multiple sensors. The characteristics jump at the pedaling frequency (4.6 Hz) and the shoulder sway (2.3 Hz) can be seen in all sensors.
- Contributions per component as measured by each sensor are found in the table below. Values are in  $\mu\text{gRMS}$

Sensor	2.3 Hz	4.6 Hz
121f03	35.2	13.5
121f04	33.2	14.7
121f05	4.3	11.0
121f08	3.3	16.3
HiRAP	51.8	27.9



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Regime:	Vibratory
Category:	Crew Exercise
Source:	Velosiped (VELO VB-3M)