

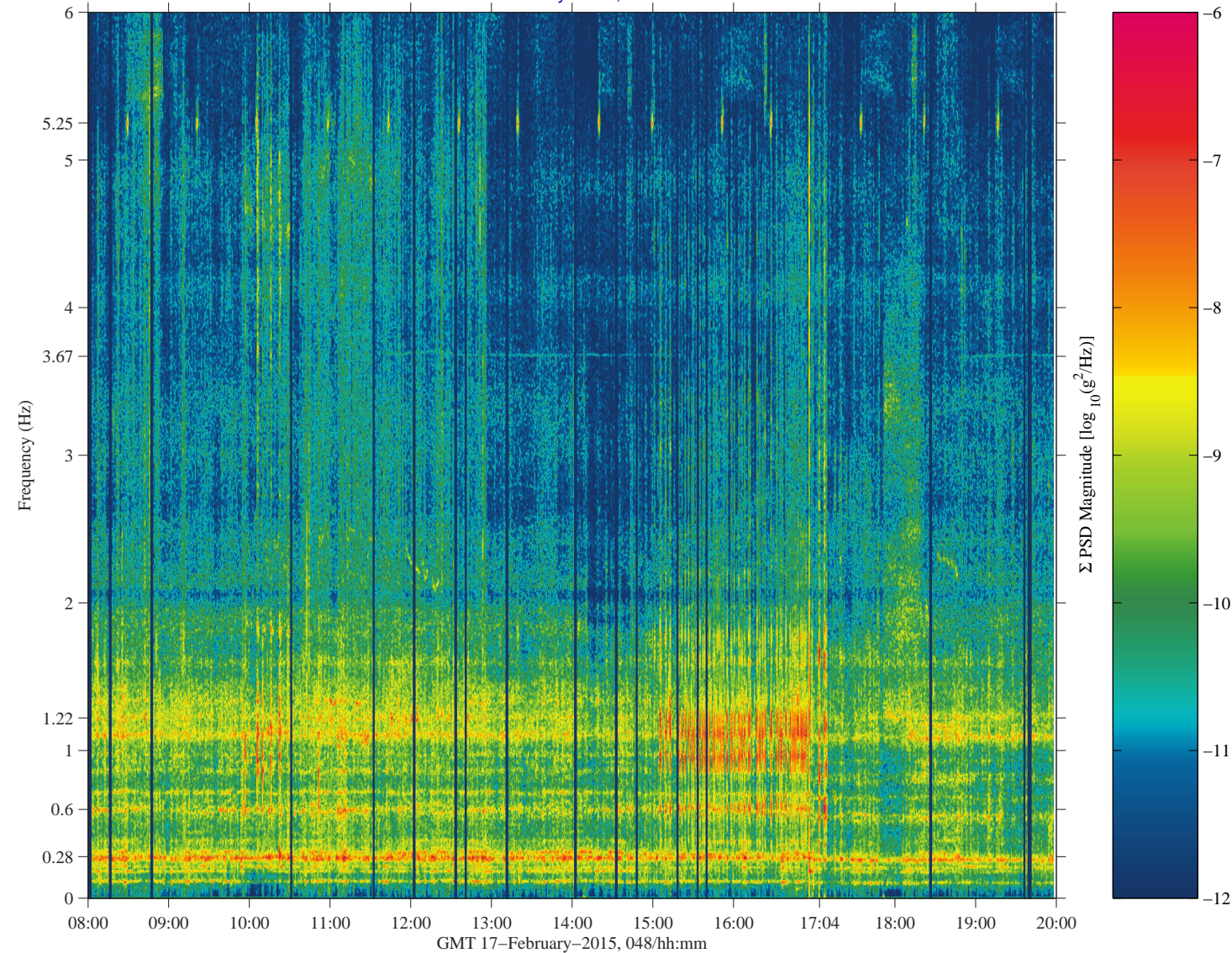
# Progress 58P Docking Quality

sams2, 121f05006 at JPM1F5, ER4, Drawer 2:[466.80 -292.06 214.58]  
 142.0000 sa/sec (6.00 Hz)  
 $\Delta f = 0.009$  Hz, Nfft = 16384  
 Temp. Res. = 30.873 sec, No = 12000

SAMS2, 121f05006, JPM1F5, ER4, Drawer 2, 6.0 Hz (142.0 s/sec)

Start GMT 17-February-2015, 048/08:00:00.002

Sum  
 Hanning, k = 1396  
 Span = 717.80 minutes

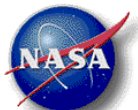


Description	
Sensor	SAMS 121f05 500.0 sa/sec, 200.0 Hz
Location	JPM1F5, ER4, Drawer 2
Plot Type	Spectrogram

### Notes:

- This color spectrogram shows a vibratory overview of events and activities that surround the Progress 58P docking event, which empirical derivation shows happened at GMT 17-Feb-2015 16:57:14.
- Notice the impulsive, transient accelerations marked by vertical streaks between about 15:00 and 17:00 come from the tight control imposed during Russian Segment (RS) attitude control.
- Note the punctuation at about 5.25 Hz we attribute to nominal operations of the Ku-band antenna as it moves (slews/spirals) to acquire the “next” communications satellite.
- Note too the faint streak near 3.67 Hz is attributed to the UPA equipment (documented previously).

Regime:	Vibratory
Category:	Vehicle
Source:	Progress 58P Docking

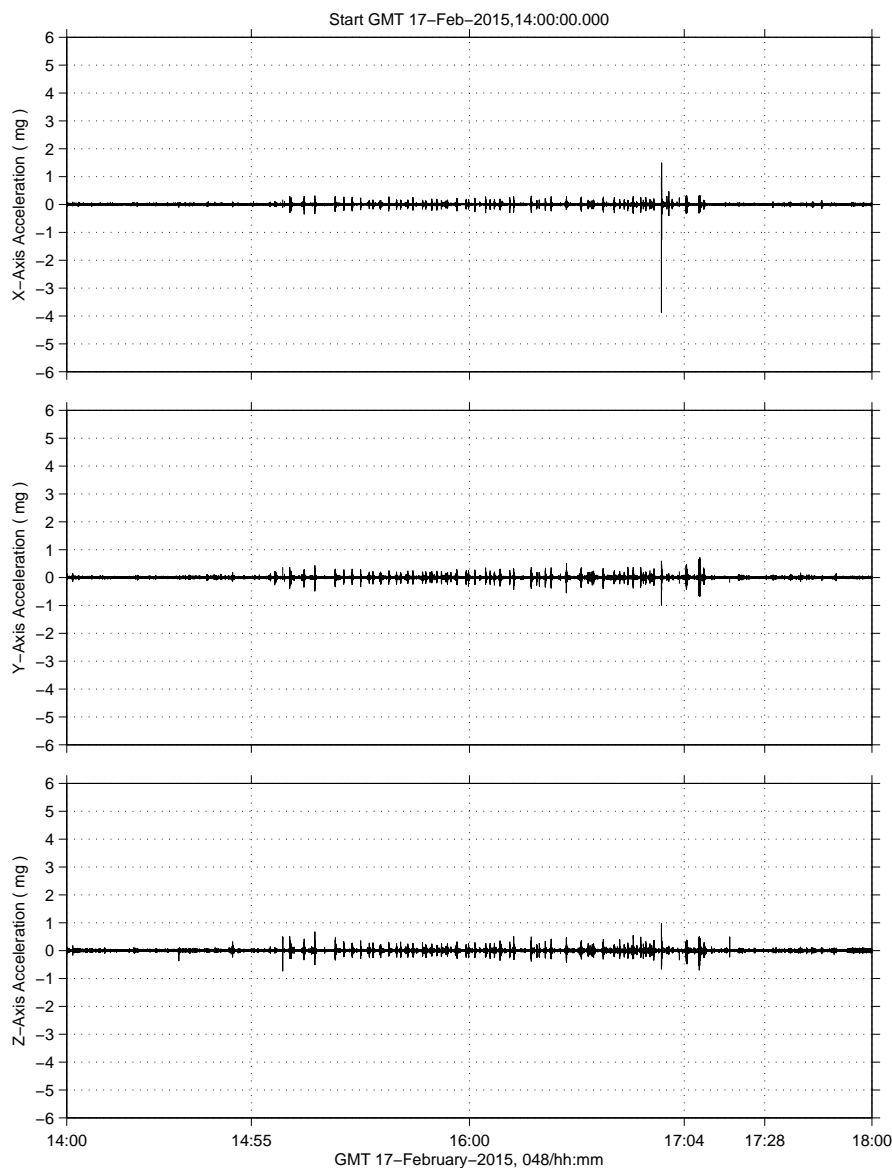


# Progress 58P Docking Quantify

sams2, 121f03006 at LAB1O1, ER2, Lower Z Panel:[191.54 -40.54 135.25]  
142.0000 sa/sec (6.00 Hz)

SAMS2, 121f03006, LAB1O1, ER2, Lower Z Panel, 6.0 Hz (142.0 s/sec)

SSAnalysis[ 0.0 0.0 0.0]



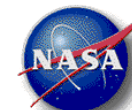
## Description

Sensor	SAMS 121f03006 142.00 sa/sec, 6.00 Hz
Location	LAB1O1, ER2, Lower Z Panel
Plot Type	Acceleration vs. Time

## Notes:

- This per-axis plot of acceleration (in mg) versus time was generated from SAMS measurements made by the 121f03 sensor in the US Lab (on LAB1O1).
- The data were low-pass filtered at 6 Hz in order to clearly show 2 primary features here.
- The first feature is the large, impulsive acceleration seen most clearly on the X-axis at about GMT 16:57:14.
- The second feature is seen as the large train of spikes between about 15:00 and 17:00.

Regime:	Vibratory
Category:	Vehicle
Source:	Progress 58P Docking

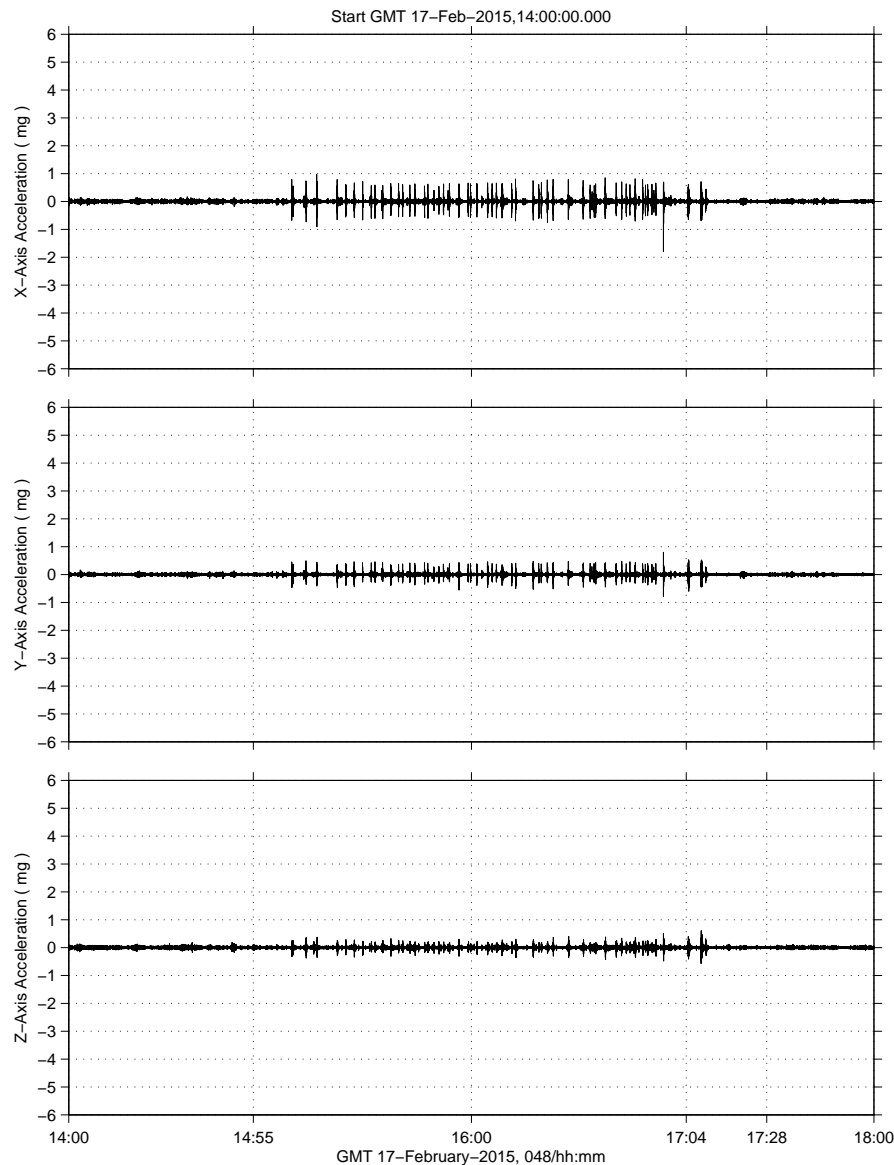


# Progress 58P Docking Quantify

sams2, 121f05006 at JPM1F5, ER4, Drawer 2,[466.80 -292.06 214.58]  
142.0000 sa/sec (6.00 Hz)

SAMS2, 121f05006, JPM1F5, ER4, Drawer 2, 6.0 Hz (142.0 s/sec)

SSAnalysis[0.0 0.0 0.0]



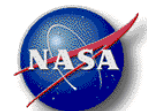
## Description

Sensor	SAMS 121f05006 142.00 sa/sec, 6.00 Hz
Location	JPM1F5, ER4, Drawer 2
Plot Type	Acceleration vs. Time

## Notes:

- This per-axis plot of acceleration (in mg) versus time was generated from SAMS measurements made by the 121f05 sensor in the JEM (on JPM1F5).
- The data were low-pass filtered at 6 Hz in order to clearly show 2 primary features here.
- The first feature is the large, impulsive acceleration seen most clearly on the X-axis at about GMT 16:57:14.
- The second feature is seen as the large train of spikes between about 15:00 and 17:00.
- Note too that in the JEM, the train of spikes on the X-axis are notably larger than those measured by SAMS in the US Lab. This is likely due to structural dynamics associated with the geometry of the ISS.

Regime:	Vibratory
Category:	Vehicle
Source:	Progress 58P Docking

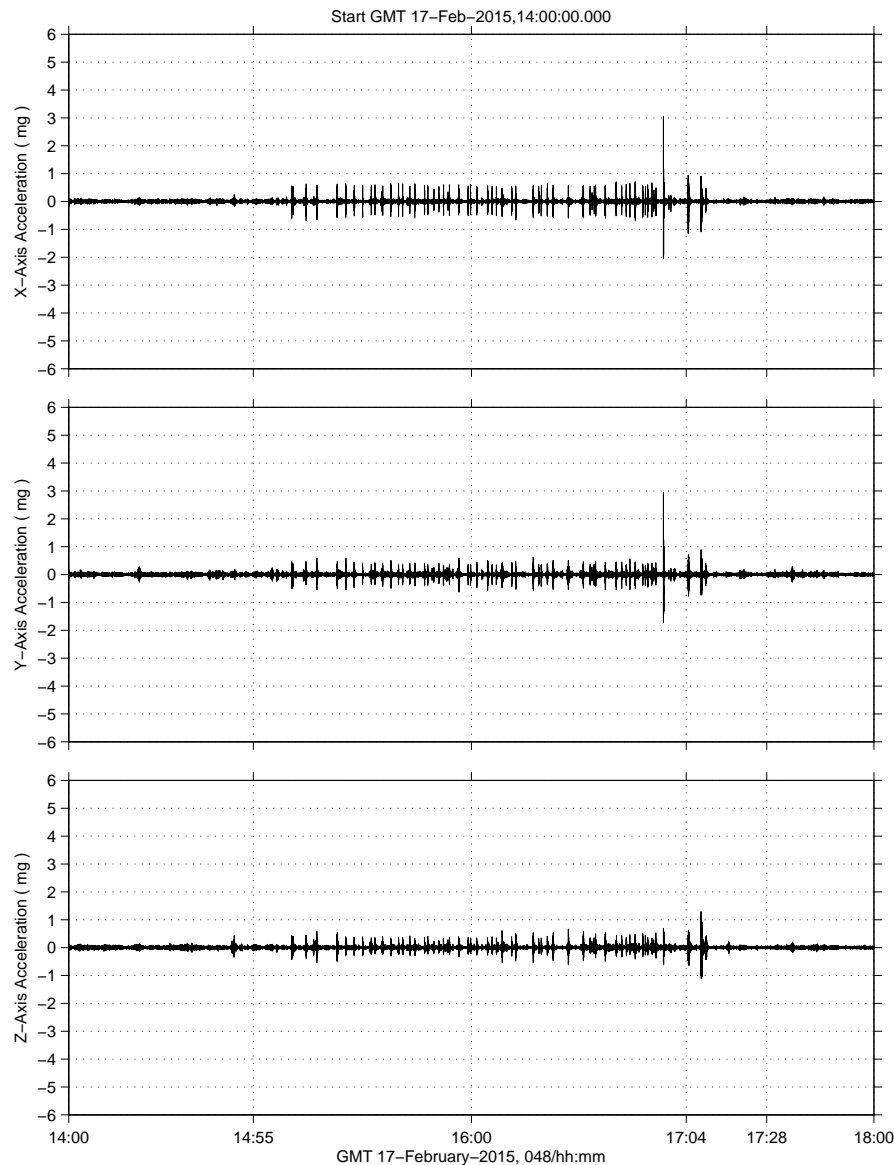


# Progress 58P Docking Quantify

sams2, 121f08006 at COL1A3, EPM, near PK-4;[371.17 287.43 165.75]  
142.0000 sa/sec (6.00 Hz)

SAMS2, 121f08006, COL1A3, EPM, near PK-4, 6.0 Hz (142.0 s/sec)

SSAnalysis[0.0 0.0 0.0]



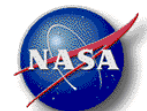
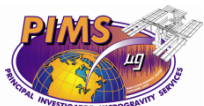
## Description

Sensor	SAMS 121f08006 142.00 sa/sec, 6.00 Hz
Location	COL1A3, EPM, near PK-4
Plot Type	Acceleration vs. Time

## Notes:

- This per-axis plot of acceleration (in mg) versus time was generated from SAMS measurements made by the 121f08 sensor in the COL (on COL1A3).
- The data were low-pass filtered at 6 Hz in order to clearly show 2 primary features here.
- The first feature is the large, impulsive acceleration seen most clearly on the X-axis at about GMT 16:57:14.
- The second feature is seen as the large train of spikes between about 15:00 and 17:00.
- Note too that in the COL, the train of spikes on the X-axis are notably larger than those measured by SAMS in the US Lab. This is likely due to structural dynamics associated with the geometry of the ISS.

Regime:	Vibratory
Category:	Vehicle
Source:	Progress 58P Docking



## Progress 58P Docking Ancillary Notes

The As-flown Time Line (ATL) shows the following entries associated with the Progress 58P Docking:  
GMT 17-Feb-2015, 048/14:55 Handover US to RS  
GMT 17-Feb-2015, 048/16:57-17:04 Free Drift for Docking (Prog on SM Aft)  
GMT 17-Feb-2015, 048/17:04-17:09 Mnvr to Post-Docking LVLH TEA  
GMT 17-Feb-2015, 048/17:28 Handover RS to US Momentum Management

Results from analysis of SAMS data during a 4-hour window around the time of docking are shown below. Note that these SAMS measurements were first low-pass filtered at 6 Hz to look past the dominant (higher-frequency) localized vibrations at the distributed SAMS sensor locations. This filtering helps show more clearly the impact of the Progress docking. Also, note that all sensors agreed that the maximum acceleration vector magnitude happened at GMT 17-Feb-2015 16:57:14 given the 4-hour window analyzed.

Analysis of the 4-hour window from GMT 17-Feb-2015,14:00 to 18:00 produced these statistics:

### 4-Hour Acceleration Vector Magnitude (mg) Stats

sensor,	rack,	location,	p25,	p50,	p75,	p95,	max
121f03006,	LAB101,	ER2 Lower Z Panel,	[0.0120,	0.0193,	0.0313,	0.0815,	3.9029]
121f05006,	JPM1F5,	ER4 Drawer 2,	[0.0200,	0.0325,	0.0521,	0.1289,	1.9207]
121f08006,	COL1A3,	EPM near PK-4,	[0.0222,	0.0352,	0.0560,	0.1372,	3.4322]
121f02006,	COL1F1,	H2 Seat Track near EML on EDR,	[0.0260,	0.0411,	0.0657,	0.2016,	4.5284]
121f04006,	LAB102,	ER1 Lower Z Panel,	[0.0112,	0.0181,	0.0292,	0.0749,	3.8891]

where the statistic column headings in the values given above are:

- p25 is the 25th percentile
- p50 is the 50th percentile (i.e. the median value)
- p75 is the 75th percentile
- p95 is the 95th percentile

