iss_rad, radgse at LAB1O2, ER1, Lockers 3,4:[135.28 −10.68 132.12]
0.0625 sa/sec (1.00 Hz)

SSAnalysis[0.0 0.0 0.0]

2014 Dragon-3 Capture and Install Qualify

Start GMT 20−April−2014, 110/08:00

Dragon-3 Capture at 11:14

GMT 20−Apr−2014, hh:mm

Description	
Sensor	ISS radgse 0.0625 sa/sec, 1.0 Hz
Location	ISS
Plot Type	Acceleration vs. Time

Notes (all times are GMT hh:mm):

- This 3-panel plot of XYZ acceleration versus time shows the primary impact to the microgravity environment associated with the capture and install of Dragon-3 cargo vehicle.
- From 08:56 to 09:01, the ISS did a maneuver to capture attitude. This is seen as a sudden step down on the Z-axis.
- Next, at 11:05 they went to attitude hold with desats (thrusters) inhibited, with SpaceX Dragon-3 free flying to Node 2 nadir port.
- At 11:14, the ISS robotic arm was used to capture the Dragon-3 cargo ship.
- From 11:40 to 11:45, the ISS did a maneuver to Dragon-berthed attitude.
- At 12:46, the ISS went to momentum management for attitude control.
- From 13:00 to 14:26, ISS thrusters were disabled to allow for Dragon-3 install via robotic arm

Regime:	Vibratory
Category:	Vehicle
Source:	2014 Dragon-3 Capture and Install

iss_rad, radgse at LAB1O2, ER1, Lockers 3,4:[135.28 −10.68 132.12]
0.0625 sa/sec (1.00 Hz)

SSAnalysis[0.0 0.0 0.0]

Start GMT 19−April−2014, 109/18:00

X−Axis Acceleration (µg)
Y−Axis Acceleration (µg)
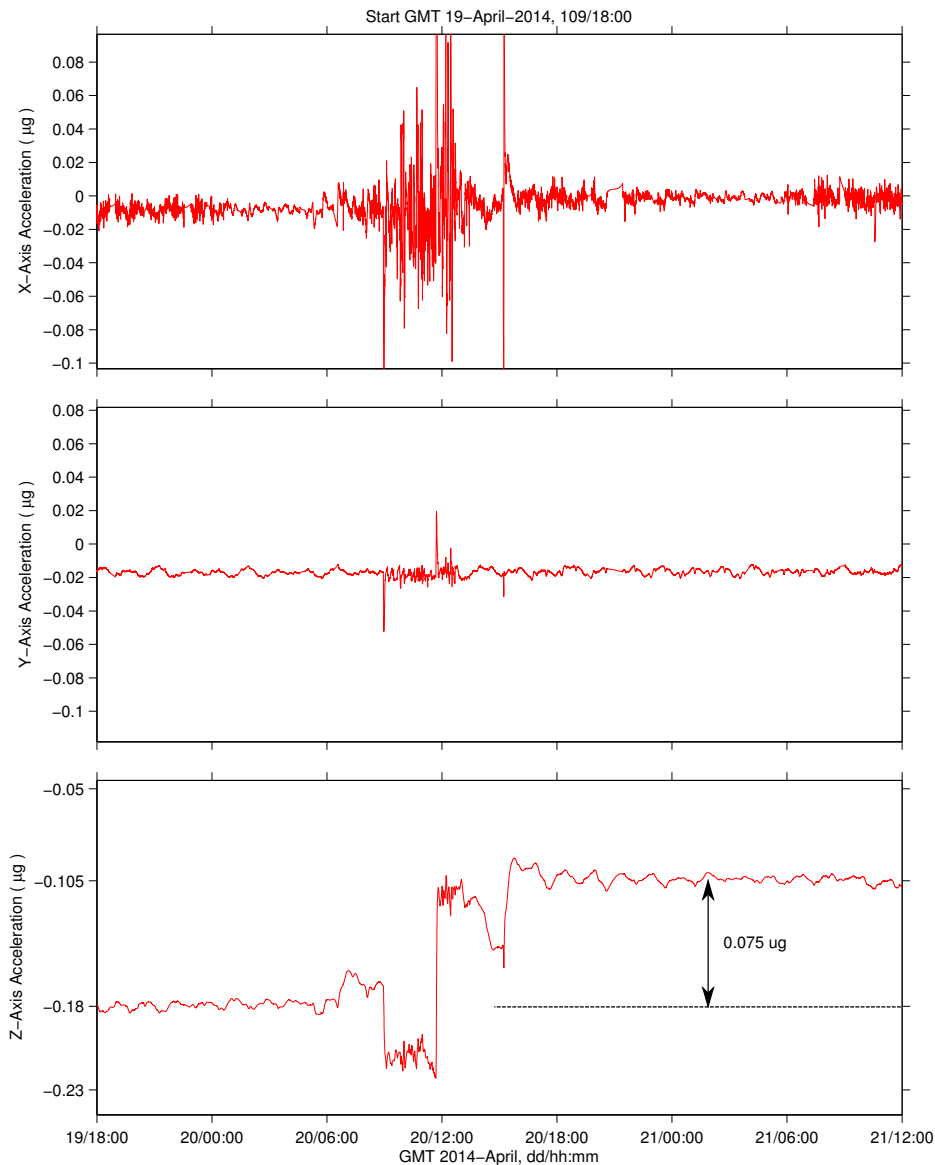Z−Axis Acceleration (µg)

0.075 ug

GMT 2014−April, dd/hh:mm
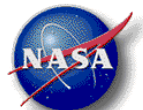
2014 Dragon-3 Capture and Install Quantify

Description	
Sensor	ISS radgse 0.0625 sa/sec, 1.0 Hz
Location	ISS
Plot Type	Acceleration vs. Time

Notes:
- This 3-panel plot of XYZ acceleration versus time is similar to the previous page, except we zoom out in time in order to better show the quantitative difference in the quasi-steady microgravity environment.
- Note before GMT 20-Apr-2014, 06:00 that the Z-axis component of the quasi-steady acceleration vector was about -0.18 ug.
- After the Dragon-3 was installed, we see a step up of the Z-axis component of the quasi-steady acceleration vector to about -0.105 ug.
- The difference, therefore, was a Z-axis shift of about 0.075 ug.
- If you look closely, you will notice that there is also a minor shift on the X-axis too when we compare before versus after Dragon-3 install.

Regime:	Vibratory
Category:	Vehicle
Source:	2014 Dragon-3 Capture and Install

Glenn Research Center
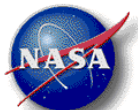
The table below shows the as-flown timeline of events leading up to Dragon-3 capture on GMT 20-Apr-2014 at 11:14 via robotic arm. This was followed by install between 13:00 and 14:26. As seen in the plots on the previous pages, the main impact on the microgravity environment was the maneuver to capture attitude, the maneuver to Dragon-berthed attitude, and the resultant shift of the quasi-steady (steady state) Z-axis acceleration vector component of about 0.075 ug.

Dragon-3 Capture (M14_110_A_03.UAF)	GMT	Att. Name	YPR	F/T Cfg	Event	4/20/2014
15	110/08:56	+XVV	356	MMT	Transition to USTO	
	—	+ZLV	357.1	UST		
		TEA	0.6			
16	110/08:56	+XVV	356	UST	Maneuver to Capture Attitude	
	110/09:01	+ZLV	356	UST		
			1			
17	110/11:05	+XVV	356	UST	Transition to Att Hold with Desats Inhibit (SpaceX FF to N2 Nadir)	**Capture at 11:14**
	—	+ZLV	356	AHC		
			1			
18	110/11:20	+XVV	356	AHC	Transition to USTO	
	—	+ZLV	356	UST		
			1			
19	110/11:40	+XVV	356	UST	Maneuver to Dragon berthed TEA w/ PSARJ 270, SSARJ 90	
	110/11:45	+ZLV	358.1	UST		
		TEA	0.6			
20	110/12:46	+XVV	356	UST	Transition to Momentum Management using USTO	TEA for VV#3z N2nDze, PSARJ 270, SSARJ 90
	—	+ZLV	358.1	SAT		
		TEA	0.6			
Dragon-3 Install (M14_110_B_03.UAF)						4/20/2014
21	110/13:00	+XVV	356	SAT	Disable Thrusters	
	110/14:26	+ZLV	358.1	SAT		
		TEA	0.6			
22	110/14:26	+XVV	356	SAT	Enable Thrusters	
	—	+ZLV	358.1	MMT		
		TEA	0.6			

DRAGON DELIVERS CARGO TO STATION

PIMS ISS Acceleration Handbook
Date last modified 2014-04-30

Glenn Research Center