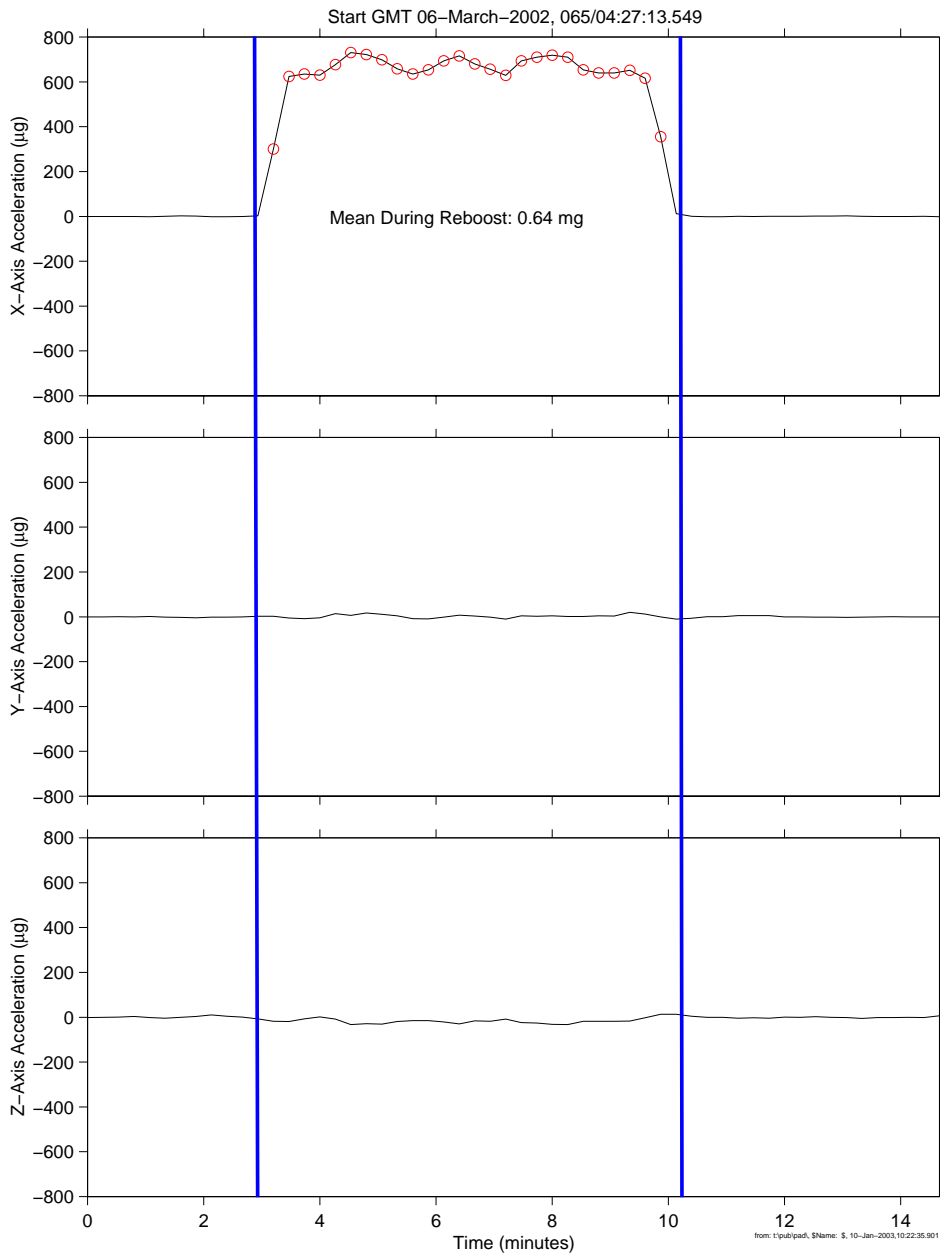


Progress Reboost

mams_ossbtmf at LAB1O2, ER1, Lockers 3,4[135.28 -10.68 132.12]
0.0625 sa/sec (1.00 Hz)

Increment: 4, Flight: UF1
SSAnalysis[0.0 0.0 0.0]

8 Progress +X Thrusters, Off-Pulsing



Description

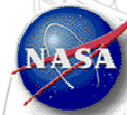
Sensor	MAMS,ossbtmf 0.0625 sa/sec (0.01 Hz)
Location	LAB1O2, ER1, Lockers 3,4
Orientation	Space Station Analysis (SSA)
Inc/Flight	Increment: 4, Flight: UF1
Plot Type	Time Series

NOTES:

- Periodic reboosts of the ISS are necessary due to orbital decay.
- The primary method for conducting a reboost is using the aft facing attitude control thrusters of a docked cargo vehicle, typically a Progress.
- Station reboosts are open loop burns, where the firing is initiated at a prescribed time and place in orbit. Reboosts usually take two burns
- Data shown was for Burn #2 and lasted 401 seconds using 143.8 kg of propellant.



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Regime:	Quasi-steady
Category:	Vehicle
Source:	Reboost

Progress Reboost

The table below compares average acceleration from vehicle data to the average acceleration calculated from MAMS

Reboost Information					Calculations from MAMS OSS data		
Ignition (GMT)	Comments	ΔV (m/sec)	Duration (sec)	$\Delta V/T$ (mg)	Duration (sec)	ΔV (m/sec)	X-Axis Mean (mg)
11-Oct-2001, 284/10:31	4 Progress +X Thrusters	4.7	1560	0.31	1,629.30	4.63	0.29
11-Oct-2001, 284/15:54	4 Progress +X Thrusters	4.5	1560	0.29	1,623.78	4.46	0.28
10-Jan-2002, 010/01:35:15	4 Progress +X Thrusters	5.4	1877	0.29	1,863.90	5.3	0.29
10-Jan-2002, 010/03:43:26	4 Progress +X Thrusters	4.8	1654	0.30	1,643.00	4.67	0.29
21-Feb-2002, 052/08:27	8 Progress +X Thrusters, Off-Pulsing	1.35	239	0.58	237.40	1.21	0.52
21-Feb-2002, 052/09:59	8 Progress +X Thrusters, Off-Pulsing	1.35	243	0.57	238.50	1.24	0.53
06-Mar-2002, 065/03:37:12	8 Progress +X Thrusters, Off-Pulsing	1.0	158.2	0.65	157.70	0.93	0.60*
06-Mar-2002, 065/04:29:07	8 Progress +X Thrusters, Off-Pulsing	2.5	395.1	0.65	398.80	2.5	0.64*
13-Mar-2002, 072/00:04:10	8 Progress +X Thrusters, Off-Pulsing	2.2	319	0.70	300.30	1.8	0.61*
13-Mar-2002, 072/00:52:49	8 Progress +X Thrusters, Off-Pulsing	4.0	636.1	0.64	609.70	3.94	0.66*
19-Apr-2002, 109/07:59	8 Progress +X Thrusters, Off-Pulsing	0.73	118	0.63	142.70	0.6	0.43
01-Aug-2002, 213/17:24:23	8 Progress +X Thrusters, Off-Pulsing	4.3	760	0.58	761.10	4.18	0.56
11-February-2003 042/11:34:30	8 Progress +X Thrusters, Off-Pulsing	5.1	~1200	0.43	1168	4.01	0.35
12-March-2003 071/22:58	Progress Manifold 1 4 Progress +X Thrusters	1.38	597	0.24	634	1.3	0.21
12-March-2003 072/23:37	Progress Manifold 2 4 Progress +X Thrusters	0.37	198	0.19	219	0.3	0.14
04-April-2003 094/12:59:18	8 Progress +X Thrusters Off-Pulsing	1.8	N/A	N/A	835	1.83	0.23
10-Apr-2003, 100/10:55	8 Progress +X Thrusters Off-Pulsing	1.48	661	0.23	672	1.43	0.22

Description	
Sensor	MAMS,ossbtmf 0.0625 sa/sec (1 Hz)
Location	LAB102, ER1, Lockers 3,4
Orientation	Space Station Analysis (SSA)
Inc/Flight	Increments: 3-9 Flights: Various
Plot Type	Time Series

NOTES:

- Reboost Information column contains estimates. This information was obtained from Rex Delventhal, GNC Daily Reports and/or On-Orbit Summaries.
- Values marked with an asterisk may be off by as much as 14 ug due to lack of bias compensation for OSS A-range data.



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Regime:	Quasi-steady
Category:	Vehicle
Source:	Progress Thrusters

Progress Reboost

The table below compares average acceleration from vehicle data to the average acceleration calculated from MAMS

Reboost Information					Calculations from MAMS OSS data		
Ignition (GMT)	Comments	ΔV (m/sec)	Duration (sec)	$\Delta V/T$ (mg)	Duration (sec)	ΔV (m/sec)	X-Axis Mean (mg)
30-May-2003, 150/16:50	8 Progress +X Thrusters Off-Pulsing	1.0	447	0.23	448	0.93	0.21
01-Oct-2003 274/13:11	8 Progress +X Thrusters Off-Pulsing	1.7	450	0.38	469	1.72	0.36
08-Jan-2004, 008/19:59	8 Progress +X Thrusters, Off-Pulsing	1.4	329	0.43	367	1.41	0.39
02-Mar-2004, 062/22:40	8 Progress +X Thrusters, Off-Pulsing	2.2	531	0.42	528	2.08	0.40
18-May-2004, 139/16:50	8 Progress +X Thrusters, Off-Pulsing	2.3	480	0.49	511	2.18	0.43
20-Aug-2004, 233/01:24	8 Progress +X Thrusters, Off-Pulsing	1.3	352	0.37	352	1.38	0.40
23-Sep-2004, 267/12:05	8 Progress +X Thrusters, Off-Pulsing	2.7	N/A	N/A	655	2.64	0.41

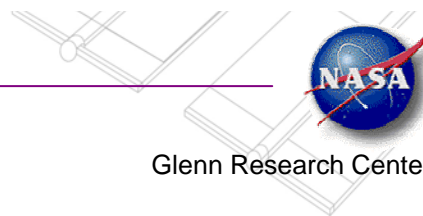
Description	
Sensor	MAMS,ossbtmf 0.0625 sa/sec (1 Hz)
Location	LAB1O2, ER1, Lockers 3,4
Orientation	Space Station Analysis (SSA)
Inc/Flight	Increments: 3-9 Flights: Various
Plot Type	Time Series

NOTES:

- Difference in duration values between MAMS calculations and estimates may due to trimmed mean filter effects and MAMS OSS temporal resolution. These factors affect the accuracy of the ΔV calculations.



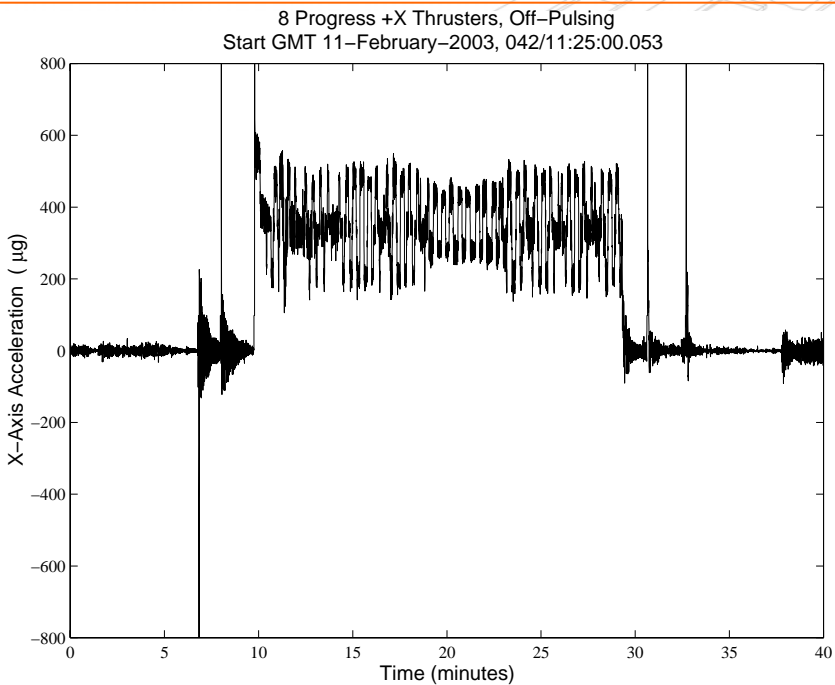
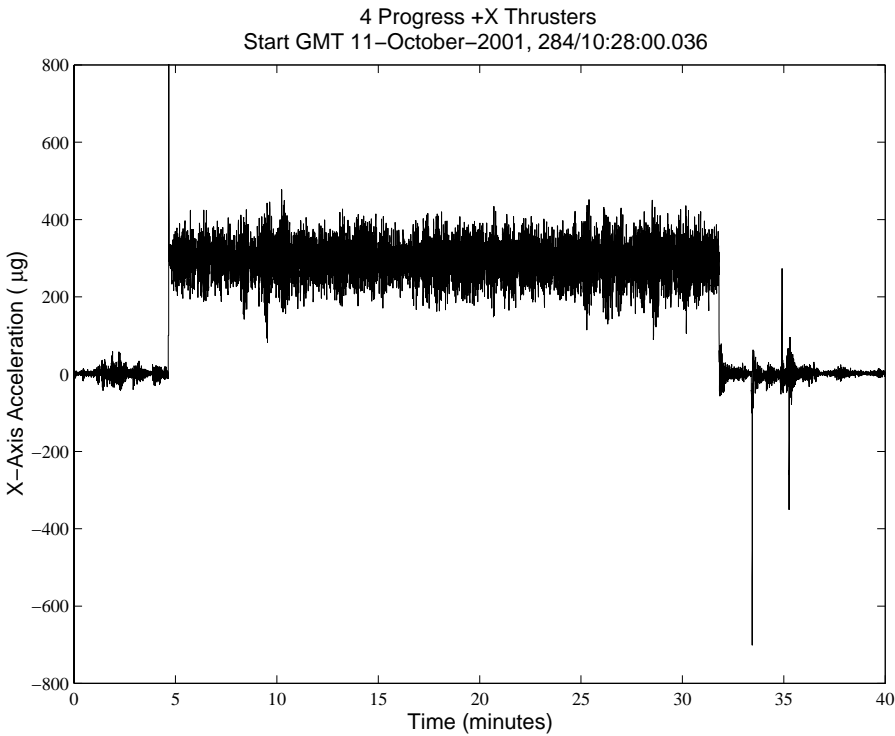
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Regime:	Quasi-steady
Category:	Vehicle
Source:	Progress Thrusters

Progress Reboost



Description

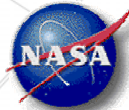
Sensor	MAMS,osraw 10 sa/sec (1 Hz)
Location	LAB1O2, ER1, Lockers 3,4
Orientation	Space Station Analysis (SSA)
Inc/Flight	Increment: 3-9 Flight: Various
Plot Type	Time Series

NOTES:

- In the "4 Progress +X Thrusters", four thrusters are pointed in the $-X_A$ direction and four other YZ thrusters are used for attitude control.
- "8 Progress +X Thrusters, Off-Pulsing", all thrusters are $-X_A$ direction; four on continuous, other four pulse on/off.
- Bias compensated OSSRAW data is shown to highlight the different modes. The trimmed mean filtered process masks this detail.



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Regime:	Quasi-steady
Category:	Vehicle
Source:	Reboost