

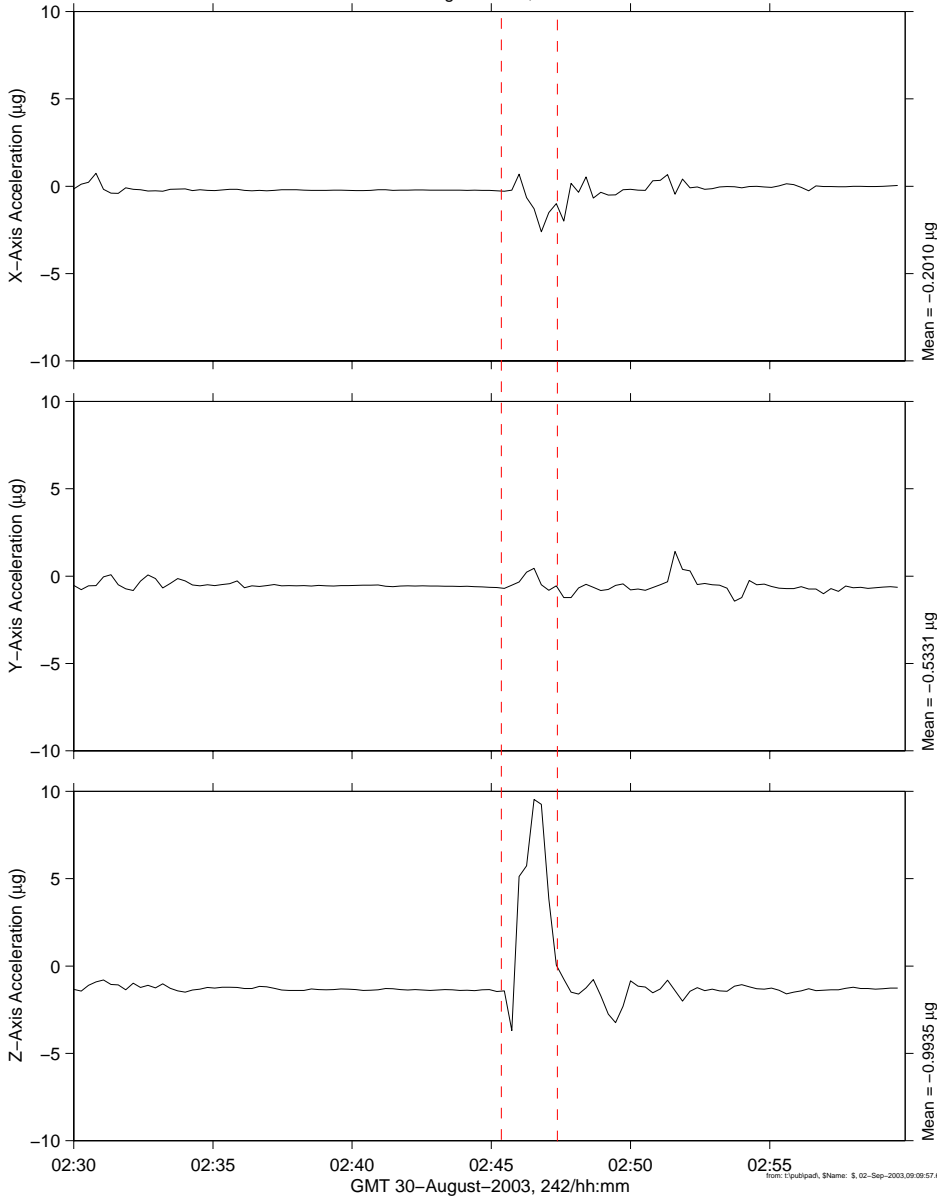
# Russian / US GNC Force Fight

mams, ossbtmf at LAB1O2, ER1, Lockers 3,4:[135.28 -10.68 132.12]  
0.0625 sa/sec (0.01 Hz)

Increment: 7, Flight: 6S  
SSAnalysis[ 0.0 0.0 0.0]

Force Fight, US CMG vs Russian Thrusters

Start GMT 30-August-2003, 242/02:30:08.777



## 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: 7, Flight: 6S
Plot Type	Time Series

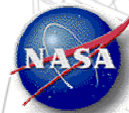
## NOTES:

- On GMT 30-Aug-2003, 242/02:45 a Loss of Attitude Control (LOAC) recovery procedure was inadvertently invoked causing the Russian system to unconditionally take control of the ISS. This included ignoring the US Guidance, Navigation and Control (GNC) control status. This resulted in a 106 second "force fight" between the Russian thrusters and US Control Moment Gyroscopes (CMG). The CMGs torqued against an RS thruster pitch adjustment until the force fight ended with CMGs saturated and their gimbals' rates zeroed
- The peak values the quasi-steady environment during the force fight event are tabulated below.

Axis	Peak (µg)
X	-2.68
Y	0.37
Z	9.59



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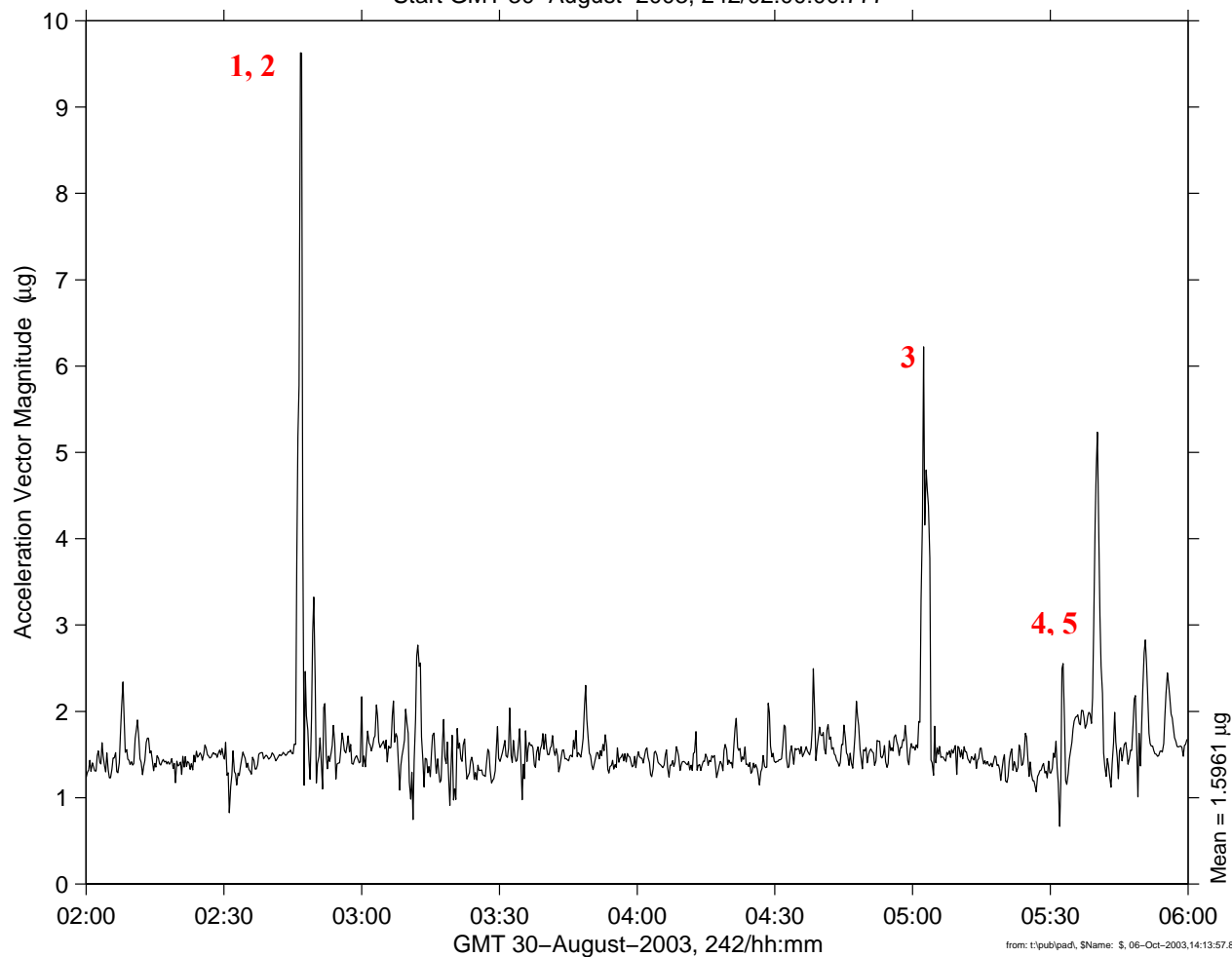
Regime:	Quasi-steady
Category:	Vehicle
Source:	Thrusters, CMG

## Russian / US GNC Force Fight

mams, ossbtmf at LAB1O2, ER1, Lockers 3,4:[135.28 -10.68 132.12]  
0.0625 sa/sec (0.01 Hz)

Increment: 7, Flight: 6S  
Vector Magnitude

Events of Force Fight and Recovery  
Start GMT 30-August-2003, 242/02:00:00.777



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: 7, Flight: 6S
Plot Type	Acceleration Magnitude

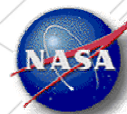
### NOTES: Timeline of Events/GMT 242

- 2:45 to 2:47** - Force fight between US CMGs and RS Thrusters.
- 2:47:15** - Loss of attitude control due to the saturation of the CMGs, SM thrusters not available for desaturation.
- 5:00** - US GN&C moded from CMGTA to Drift - Inertial
- 5:30** - Final steps for Attitude Control Handover from RS to US begun.
- 5:30:49** - Thrusters available for CMG desaturation

Event	Peak (µg)
1,2	9.83
3	6.20
4,5	5.21



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Regime:	Quasi-steady
Category:	Vehicle
Source:	Thrusters, CMG