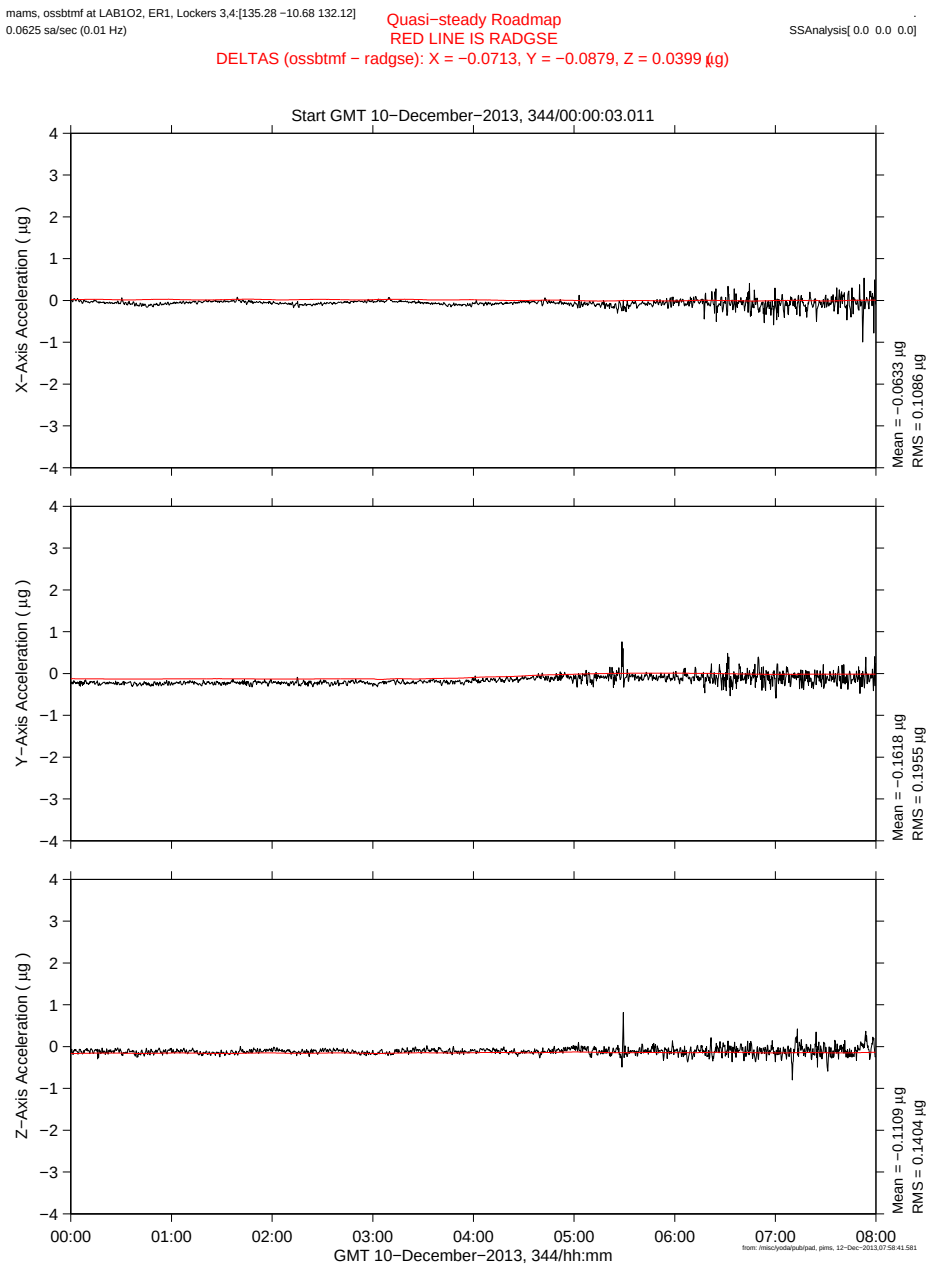
Momentum Management Maneuver From Solar Attitude to TEA

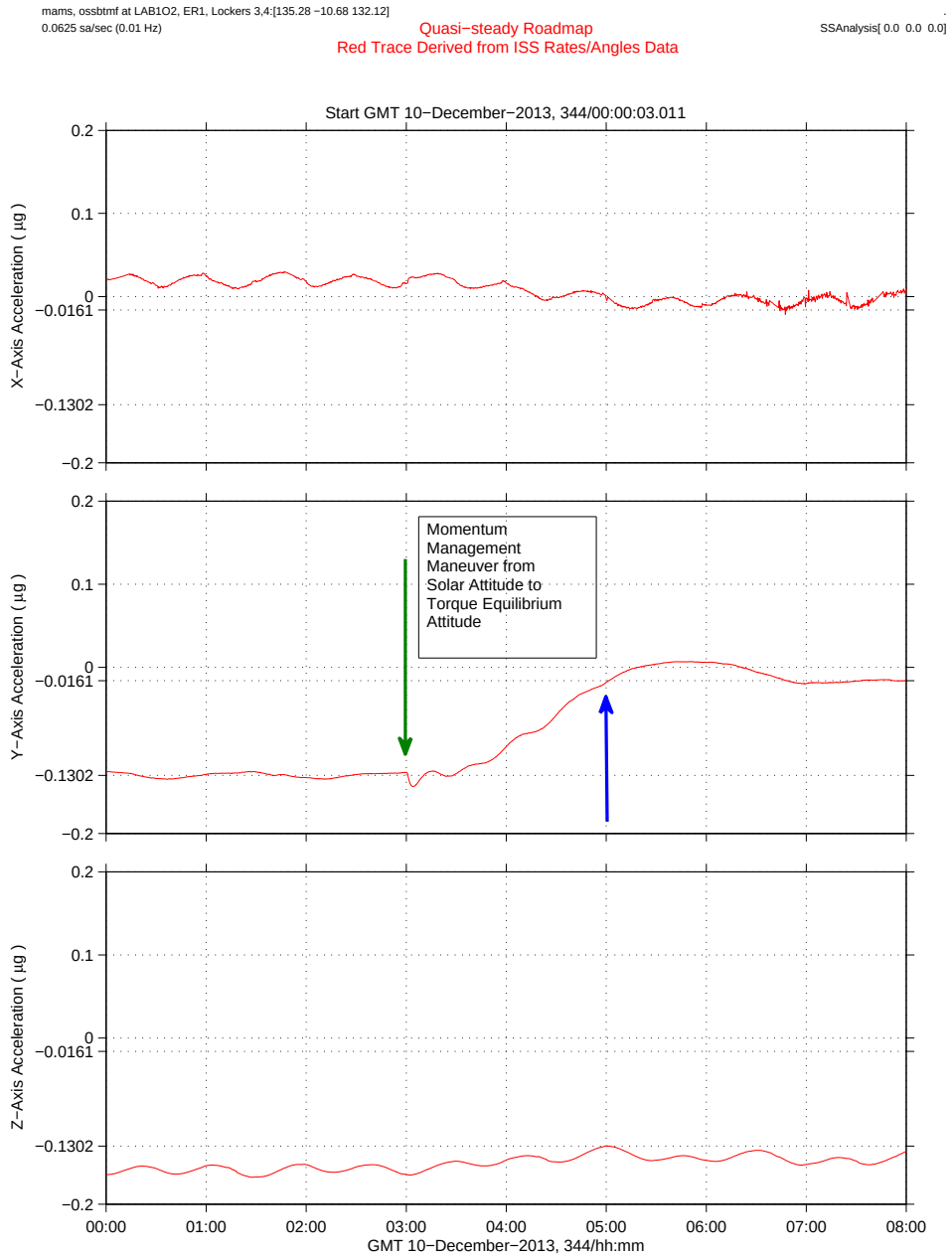


Description	
Sensor	MAMS ossbtmf 0.0625 sa/sec, 0.01 Hz
Location	LAB1O2, ER1, Lockers 3,4
Plot Type	Acceleration vs. Time

Notes:

- This 3-axis plot of MAMS quasi-steady measurement data does not clearly show the start or end of the maneuver.
- The red trace on each subplot is the quasi-steady level derived from ISS rates and angles data, while the black trace represents the MAMS measurements
- Note the vertical axis limits range from -4 to +4 ug.
- Also note that the increase in acceleration fluctuations between 05:00 and 06:00 coincide with crew wake time.

Regime:	Quasi-Steady
Category:	Vehicle
Source:	Momentum Management Maneuver From Solar Attitude to TEA



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Description	
Sensor	MAMS ossbtmf 0.0625 sa/sec, 0.01 Hz
Location	LAB1O2, ER1, Lockers 3,4
Plot Type	Acceleration vs. Time

Notes:

- This plot is identical to the one shown on the previous page, except we zoomed in by change the vertical scale to range from -0.2 to +0.2 ug.
- Also note that we kept only the red trace derived from rates and angles data to help show what happens in the quasi-steady regime during such a momentum management maneuver like this one that took place on GMT 10-Dec-2013.
- The green arrow shows a start time for the maneuver of 03:00, and the blue arrow points to the end time of about 05:00 (actually, the Mission Evaluation Room console log shows the end at 05:06).
- The primary impact of this maneuver was observed on the Y-axis with a quasi-steady shift of about 0.1141 ug.
- See table on last page for more details.

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A momentum management approach was used to maneuver and change the ISS attitude from a Solar Attitude to the nominal Torque Equilibrium Attitude (TEA). This approach is a Control Moment Gyro (CMG) only maneuver developed at Draper Lab. This approach is significantly slower than a maneuver using Russian Segment thrusters to change the space station's attitude. The MAMS plots on the previous pages and the values in the table below help quantify and otherwise characterize this slowly evolving microgravity event. The picture below shows the bundle of 4 CMGs on the ground.

Axis (SSA*)	Quasi-Steady Level (ug)		
	Before Maneuver	After Maneuver	|Δ|
X	0.0190	-0.0074	0.0264
Y	-0.1302	-0.0161	0.1141
Z	-0.1595	-0.1463	0.0132