AMSR-E Spun Down on Dec. 2015

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OUTLINE
AMSR-E was spun down to 0 RPM on December 4, 2015.

<table>
<thead>
<tr>
<th>Time (UT)</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>05:33:38</td>
<td>ADA violated momentum range of 0.015 Nms and 15 Nms</td>
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<tr>
<td>05:33:46</td>
<td>ISC TMON 41 tripped --&gt; commanded to spin down</td>
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<tr>
<td>05:35:44</td>
<td>Reached 0 RPM</td>
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</tbody>
</table>
Torque [Nm]
Momentum [NMs]

Time on 2015-12-04 (HH:MM UTC)
ADA Commanded Momentum (Left axis)
ADA Sensed Momentum (Left axis)
MWA Commanded Momentum (Left axis)
MWA Sensed Momentum (Left axis)

Upper limit
Limit over #2 -> begin spin down (TMON 41)
Lower limit
Limit over #1
Analysis

[Possible Causes]
X #1 : SPC memory failure -> Spun-down should not be controlled correctly. Inconsistent with actual phenomena.
X #2 : Temporal anomaly of ADA rotation direction signal -> There is no such an anomaly mode.
O #3 : Temporal memory anomaly by SEU -> The behavior of telemetries consistent with actual phenomena.
Presumable behavior at the spin-down

#1: Bit inversion by SEU (suppose)

#2: ADA Real Momentum in 4 sec (suppose)
- 2sec: accelerate by maximum torque
- 2sec: slow down by loss torque

#3: slope is equal to loss torque

#4: normal behavior under control

(TMON 41 tripped)

* Telemetry data was observed every 4 seconds.
Commanding

Dec 4  Sequence same as AMR_SLP_TO_SURV was executed by TMON
       →0 RPM (observation continued)

Dec 9  Conducted AMR_NORM_TO_SLP
       →Survival mode

Mar 3  Conducted AMR_SURV_to_All_off
       →All off mode
Direction
AMSR-E Main Reflector is pointing to 109 degrees left from satellite flight direction.