



# Global Precipitation Measurement (GPM) Mission Status

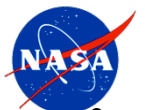


**PMM Science Team meeting**

**November 7, 2011  
Denver, Colorado**

*Art Azarbarzin, Project Manager  
Candace Carlisle/ DPM  
Jackie Fiora, DPM Resources  
Sergey Krimchansky, IS M*

- **GPM Launch Readiness Date (LRD) has been replanned to February 14, 2014**
  - GPM Replan was approved on Oct 5, 2011 by NASA Agency Program Management Council
  - Replan included a directed de-scope by HQ on Feb 2011 to de-scope GMI#2 development and accommodation on the Low Inclination Observatory (LIO) consistent with 2012 President's Budget Request: de-scope of \$45M
    - No impact to GMI #1 spare program
  - Total funding for the program includes additional HQ held budget reserve for GPM
- **Replan became necessary due to depleted schedule reserve**
  - Spacecraft hardware technical issues/rework
  - GMI delivery slip; RF subsystem development issues
  - Late DPR delivery; Recovery from earthquake and other required hardware rework
- **Mission Operation Review being replanned for Aug 2012**
  - Consistent with the new Launch Readiness Date





**Category I/Class B Mission**  
**Science Mission Directorate**  
**Earth Systematic Missions Program**  
**Lead Center: Goddard Space Flight Center**  
**Major Partner: JAXA**

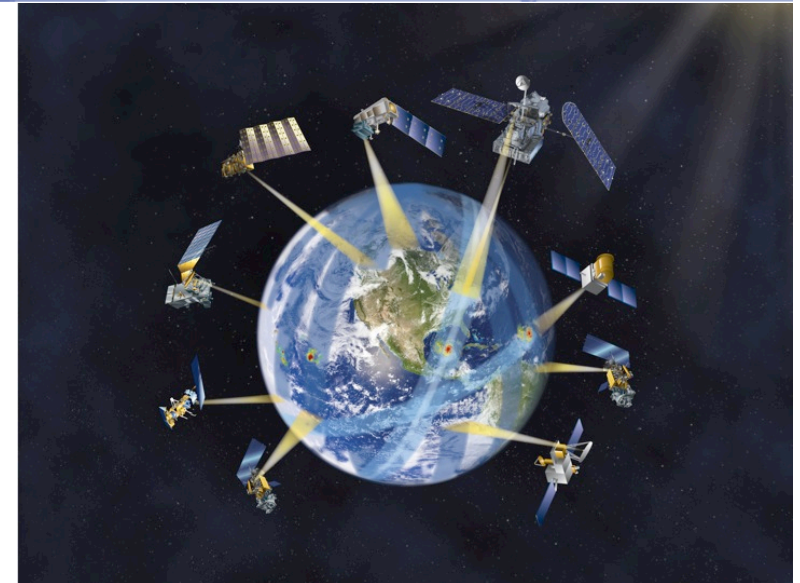
**Mission Objective:**

- Advancing precipitation measurement capability from space
- Improving knowledge of precipitation systems, water cycle variability, and fresh water availability
- Improving climate modeling and prediction
- Improving weather prediction and 4-D climate reanalysis
- Improving hydrometeorological modeling and prediction

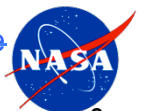
**Mission Description:**

- Constellation of spacecraft provide global precipitation measurement coverage
- NASA/JAXA Core spacecraft: Provides a microwave radiometer (GMI) and dual-frequency precipitation radar (DPR) to cross-calibrate entire constellation
  - 65° inclination, 400 km altitude
  - Launch readiness date: ~~July 2013~~ February 2014 on HII-A
  - 3 year mission (5 year propellant)
- ~~Second GMI instrument to be accommodated on a partner provided Low Inclination spacecraft: Complements Core spacecraft and partner assets~~
  - ~~~40° inclination, ~600 km altitude~~
  - ~~Launch late 2014 (TBC)~~
- Partner constellation spacecraft (JAXA, DoD, NOAA, etc.)

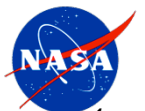
Re-plan/De-scope changes



- **Ground assets**
  - Precipitation Processing System: Data processing, archive, distribution for the entire constellation of spacecraft
  - Ground validation system: Field campaigns and a world-wide network of ground-based measurements to validate space measurements and algorithms
  - Mission Operations Center for Core Spacecraft
  - ~~Instrument Operation Center for GMI #2~~
- **Partners**
  - Japanese Aerospace and Exploration (JAXA)
    - DPR instruments for Core spacecraft
    - Launch service for Core spacecraft
  - ~~TBD, LIO Spacecraft and Launch Vehicle~~



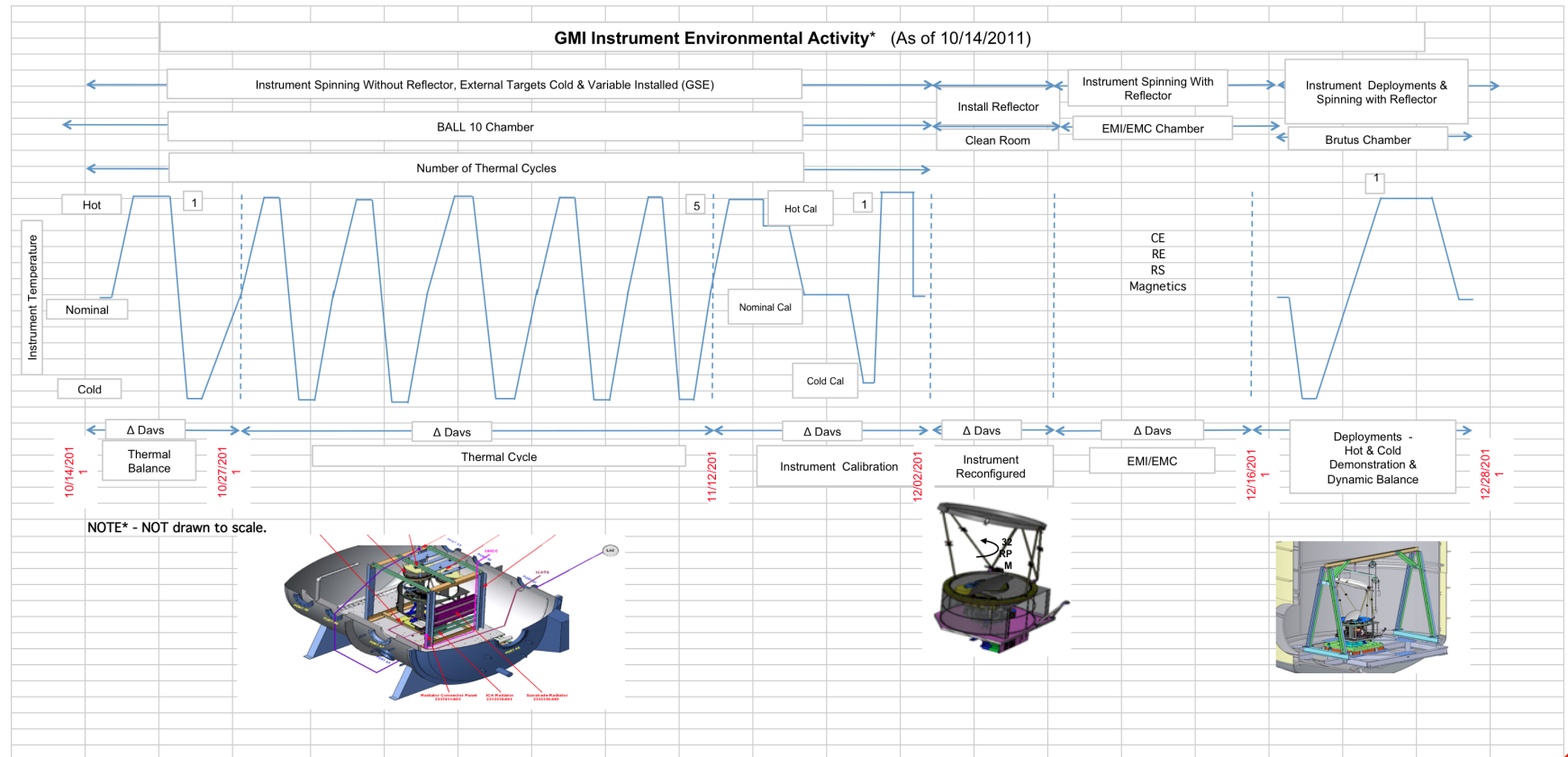
- **Began I&T in Dec 2010 with the delivery of Flight Structure and Flight Harness**
- **Flight-like ETUs integrated on spacecraft where flight hardware not available**
  - Power System Electronics; Flight Unit delivery Dec 2011
  - Command and Data handling (C&DH); Flight Unit deliveries Dec 2011 and Feb 2012
  - Mechanisms Attitude Control Electronics (MACE); Flight Unit deliveries Dec/Jan 2012
  - Scalable Space Inertial Reference Unit (SSIRU); Flight Unit delivered Nov 1, 2011
  - Test battery; I&T Battery delivery date Jan/Feb 2012 (staggered deliveries)
- **The following flight hardware have been delivered and integrated on the Core Observatory:**
  - Propulsion subsystem
  - Transponder #1 (Transponder #2 delivery 12/15/11)
  - +Y and –Y Solar Array Drive Assembly (SADA #1 & 2)
  - Propulsion Interface Electronics (PIE)
  - Deployment Firing Unit (DFU)
  - Star trackers, magnetic torquer bars, structure-mounted Coarse Sun Sensors, Three-Axis Magnetometer
  - GPS NAV-A (integrated and removed to complete box qualification)
- **High Gain Antenna System completed environmental testing and scheduled for delivery to I&T on Nov 16 2011**
- **All Flight Solar Array panels delivered, tested and wing integration in progress**
  - Qualification Array completed ambient Deployment and preparing for T/V deployment

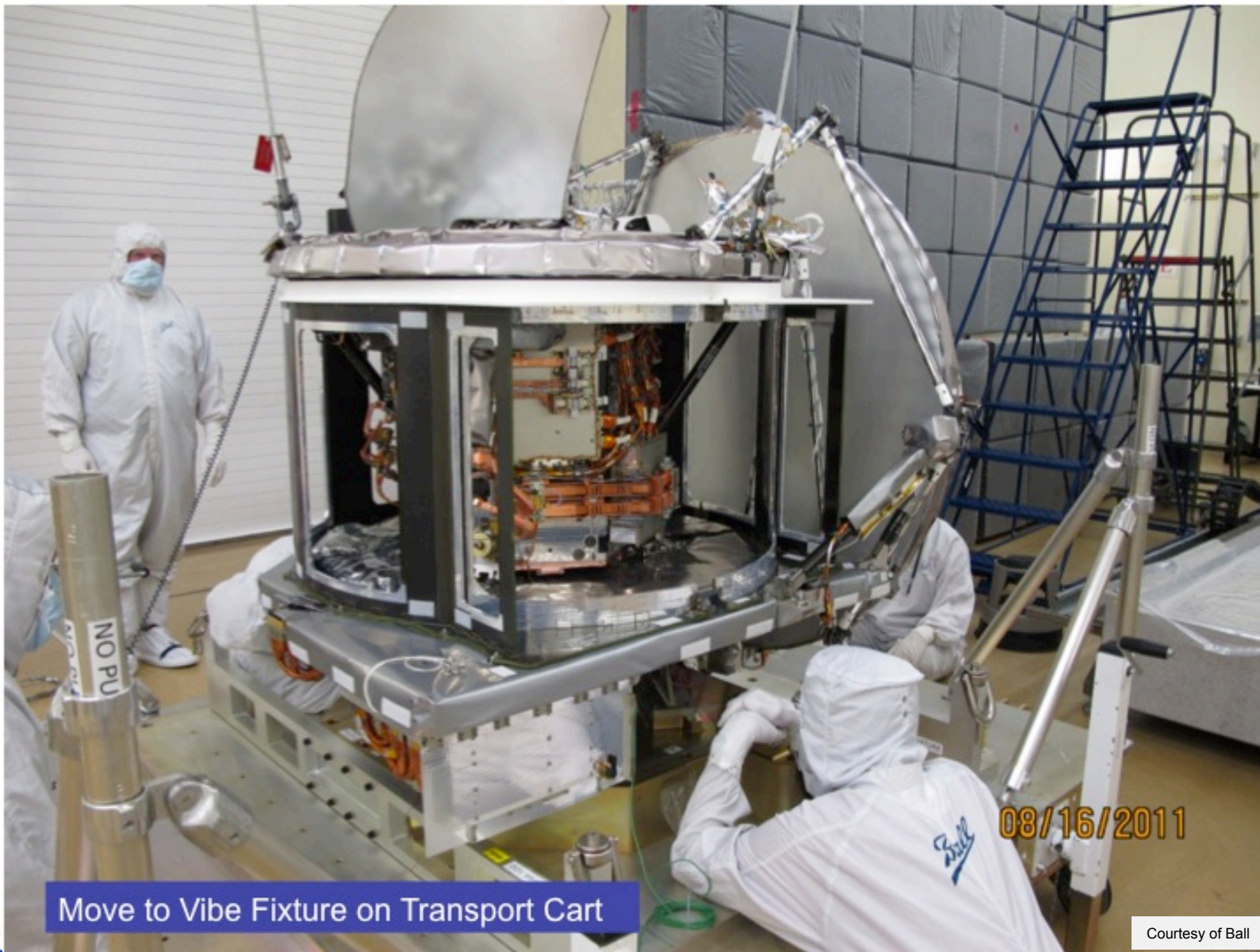






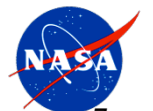
- **GPM Microwave Imager (GMI)**
  - Completed EMI test part 1
  - Thermal Vacuum Test in Progress; completed Hot/Cold Thermal Balance tests and continuing with thermal cycling
  - Holding late January (2012) ship date to GSFC



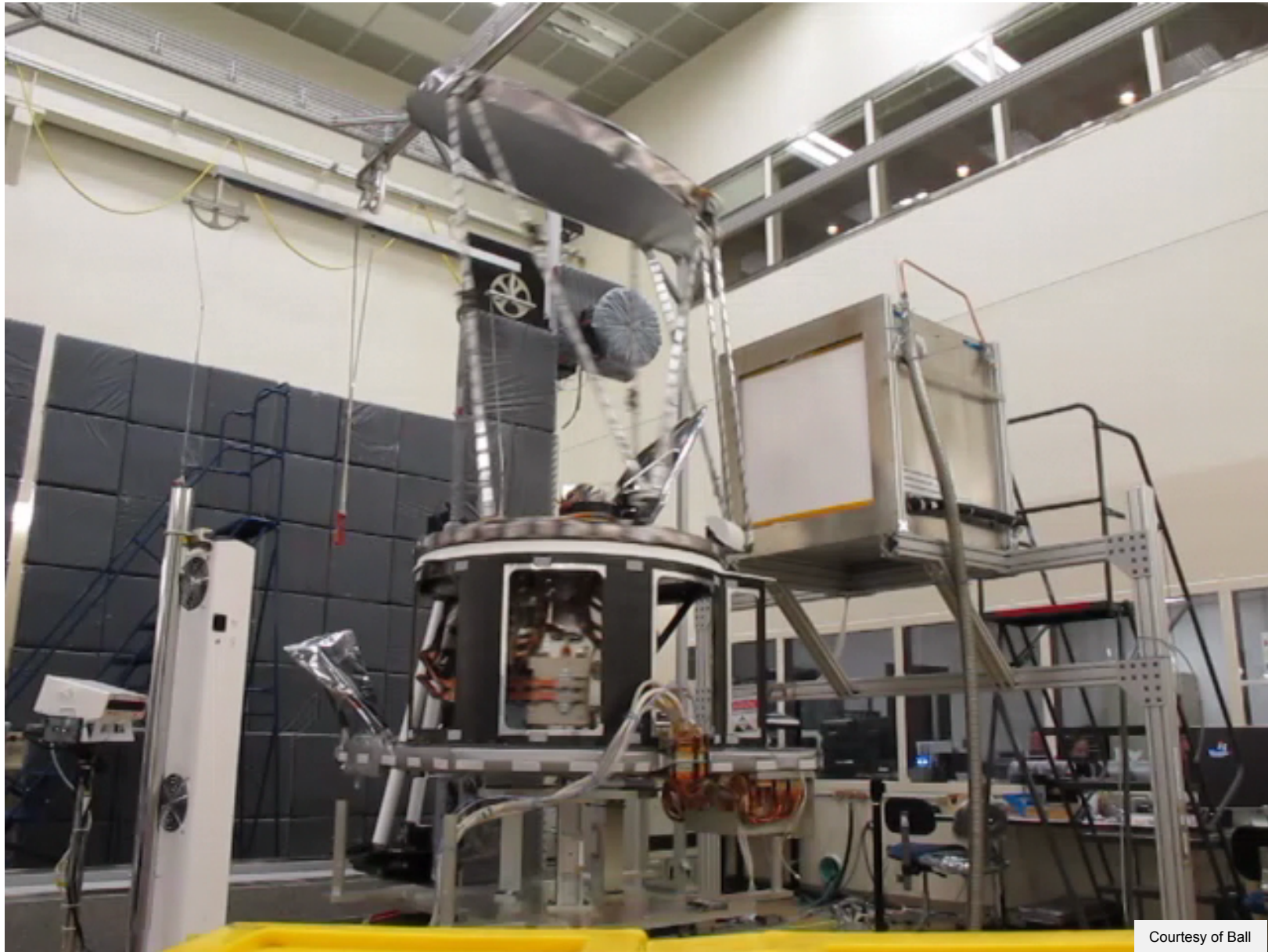


Move to Vibe Fixture on Transport Cart

Courtesy of Ball







Courtesy of Ball

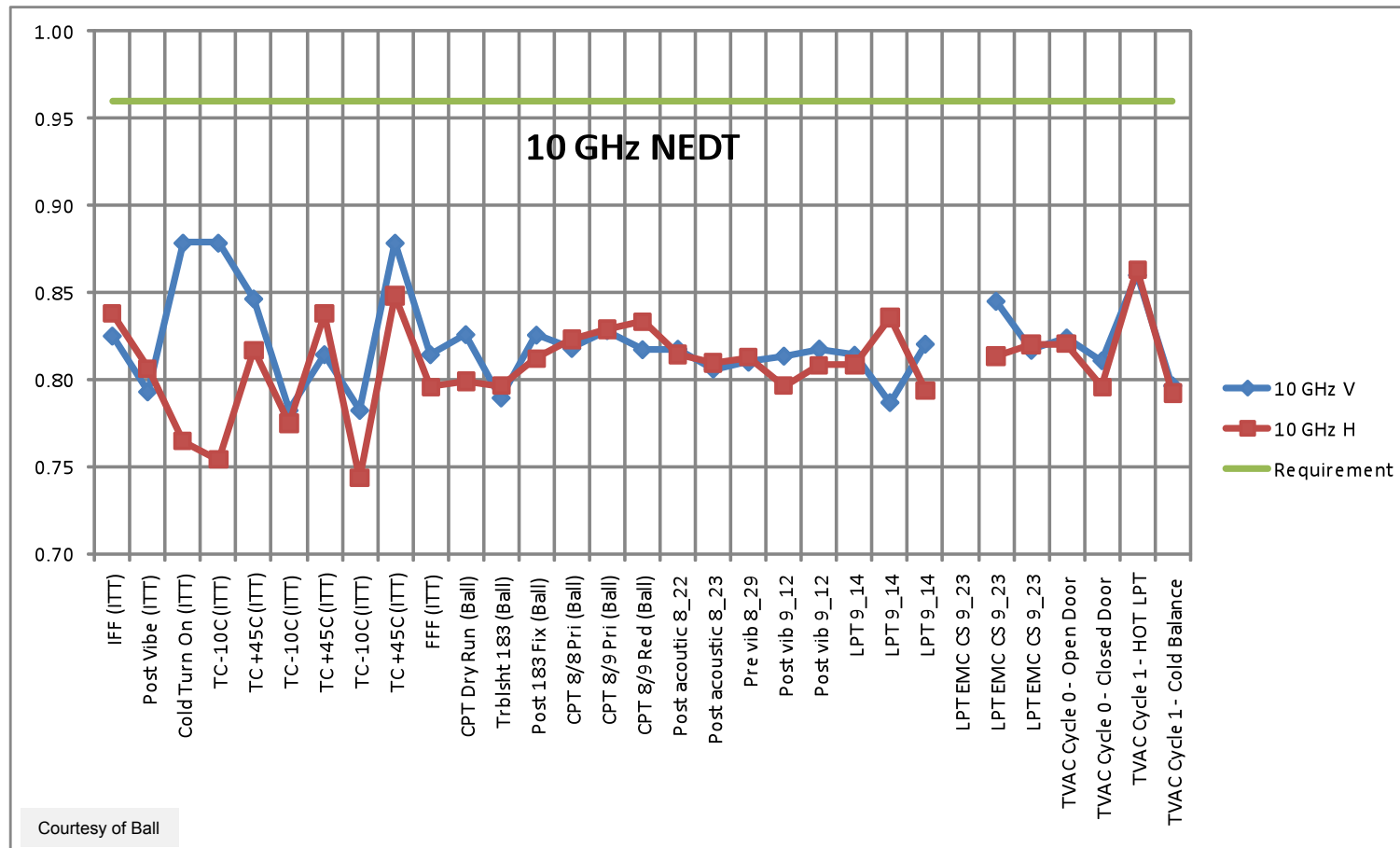


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GODDARD SPACE FLIGHT CENTER





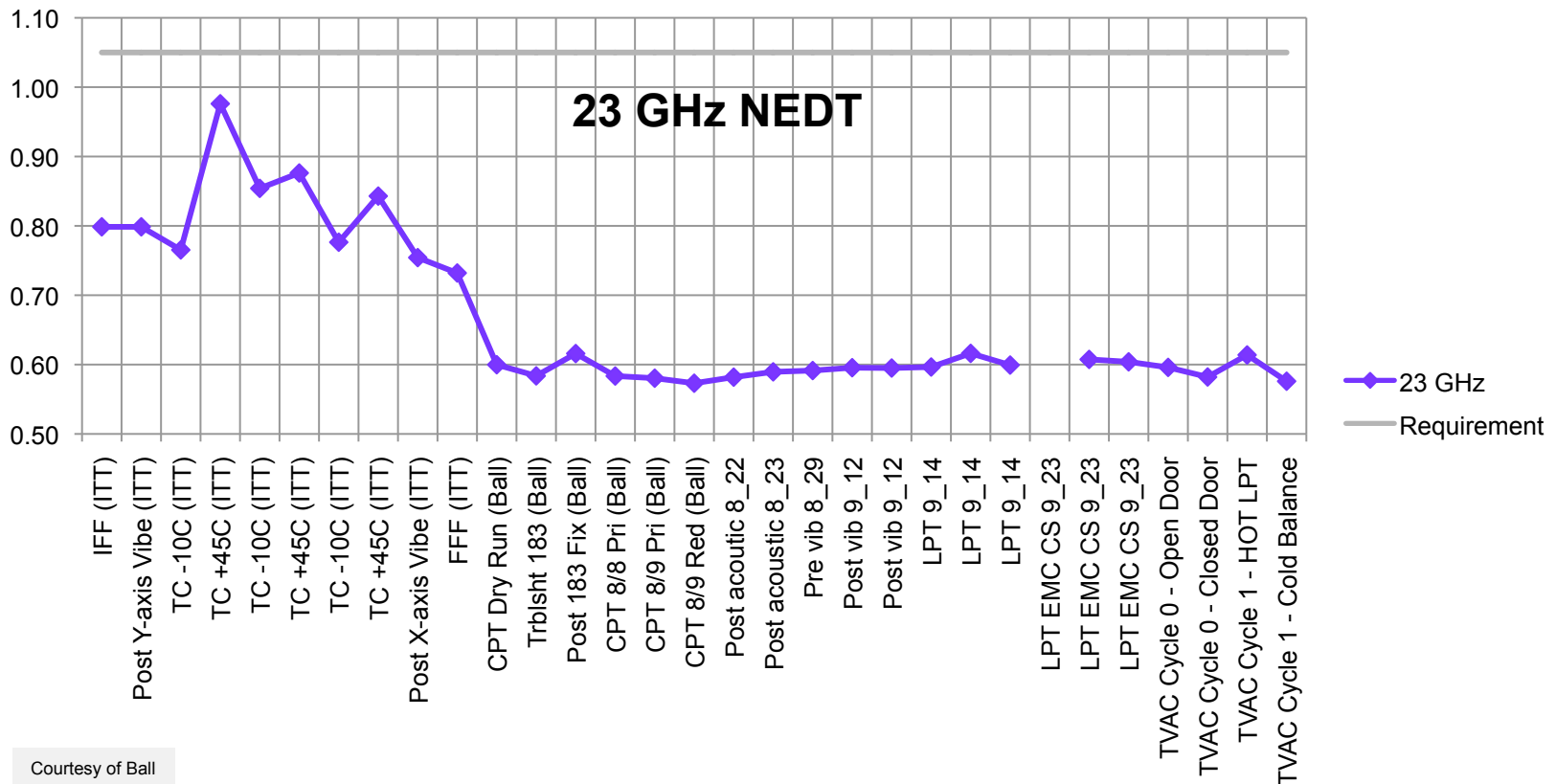


- **Good trend data**
- **Significant margin relative to requirement**





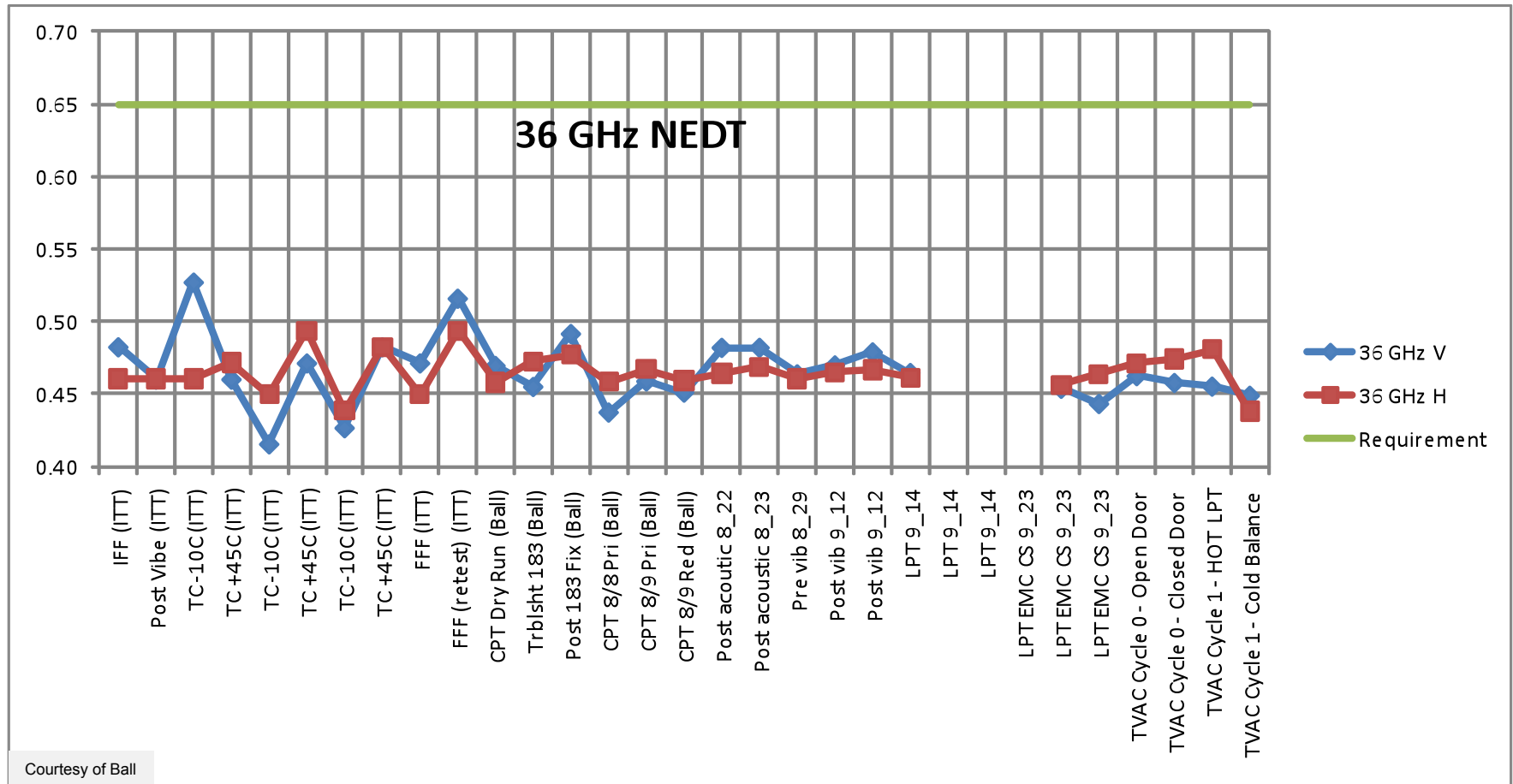




Courtesy of Ball

- **Good trend data**
- **Significant margin relative to the requirement**
- **ITT data had 60 Hz noise corruption which increased the measured value on this channel**





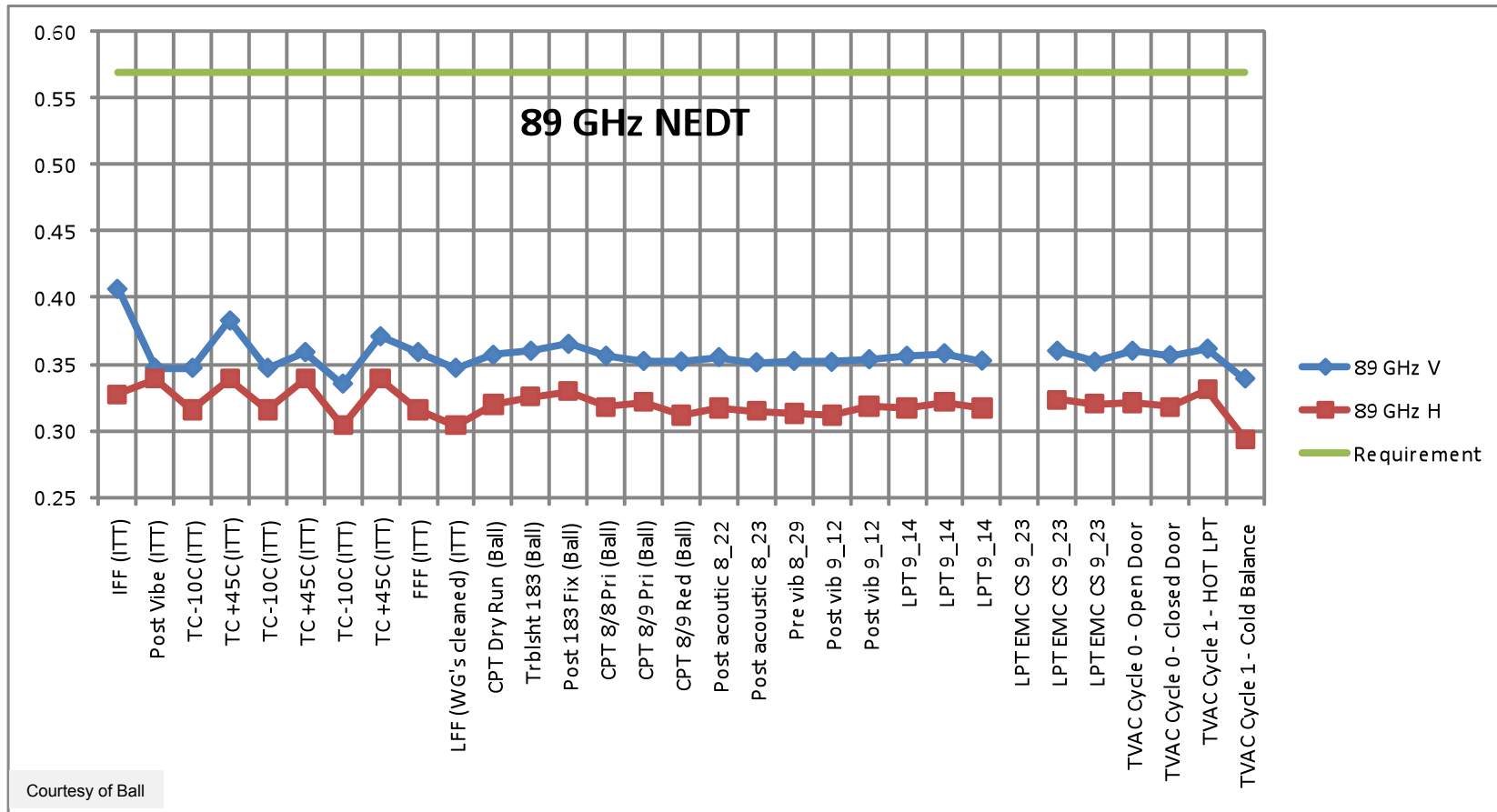
- **Good trend data**



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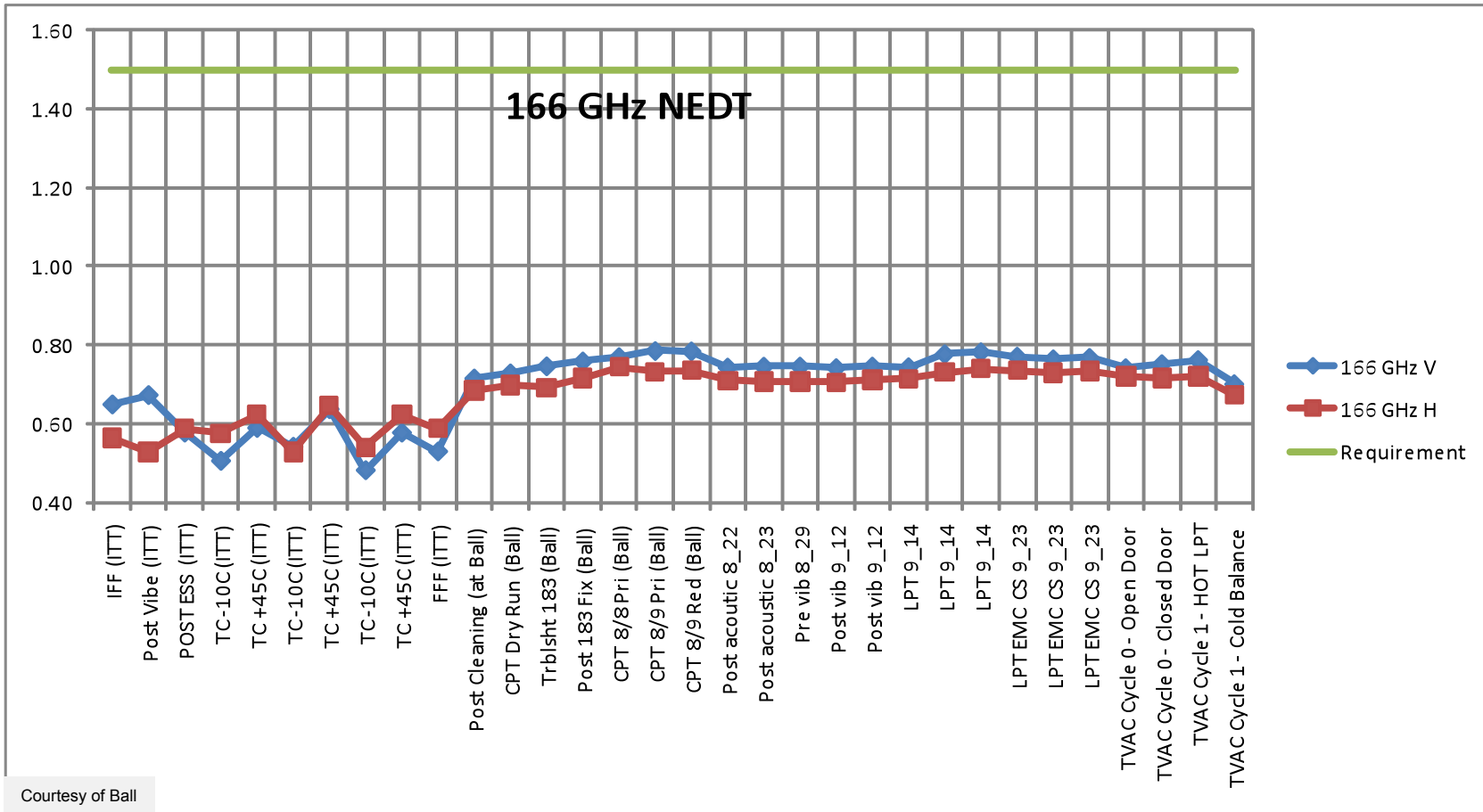






• **Good trend data**

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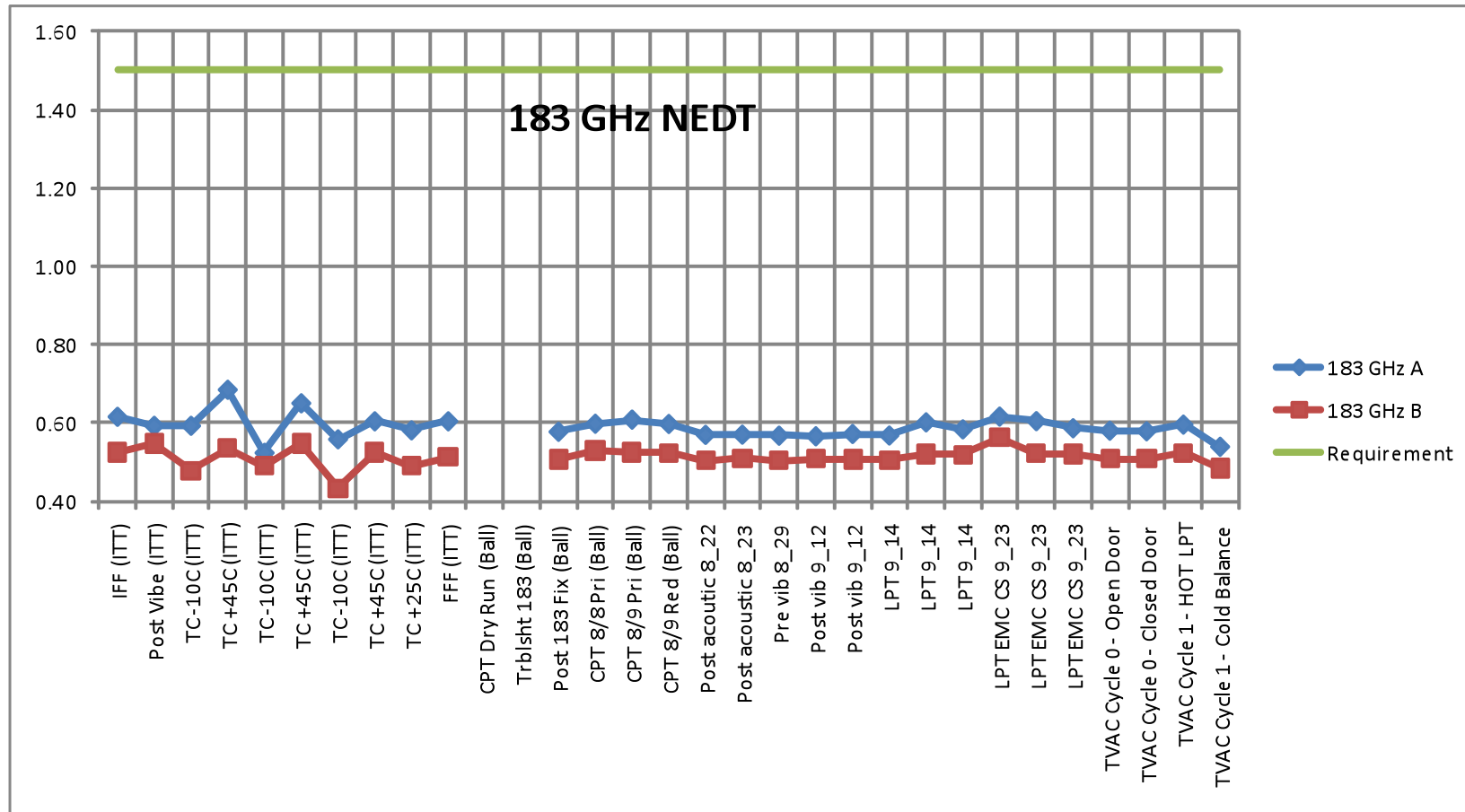


• **Good trend data**

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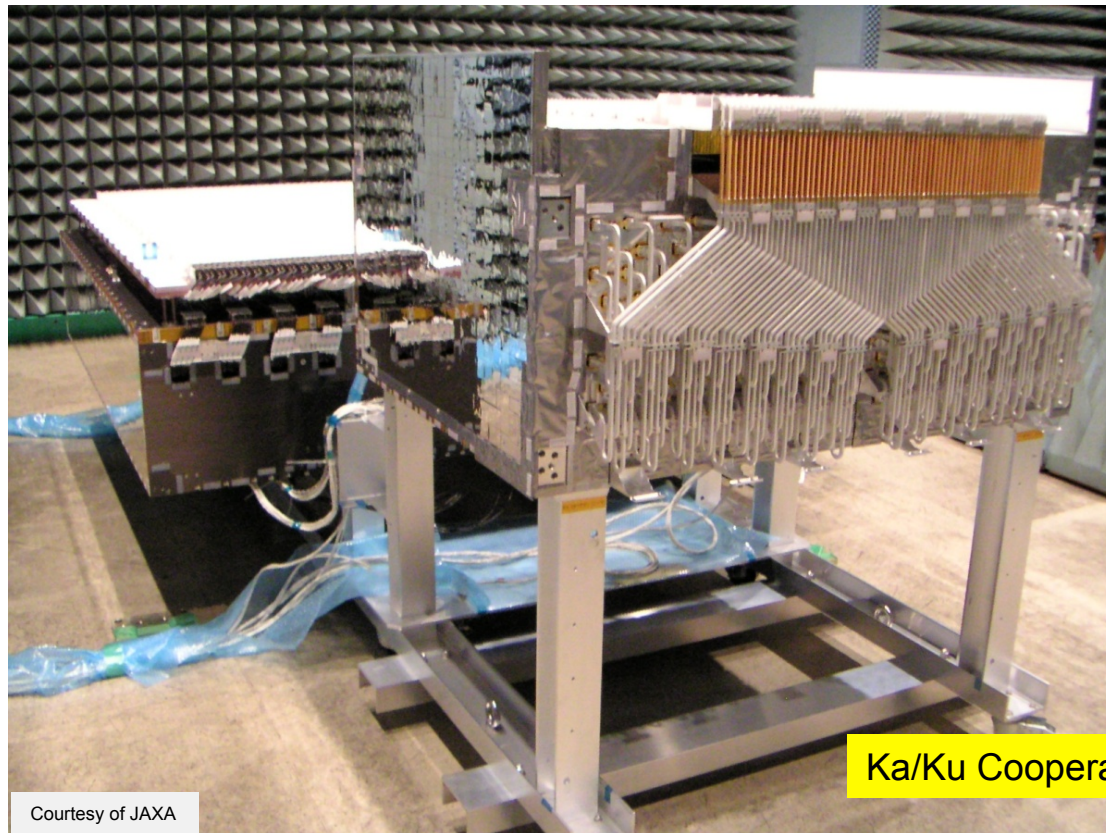




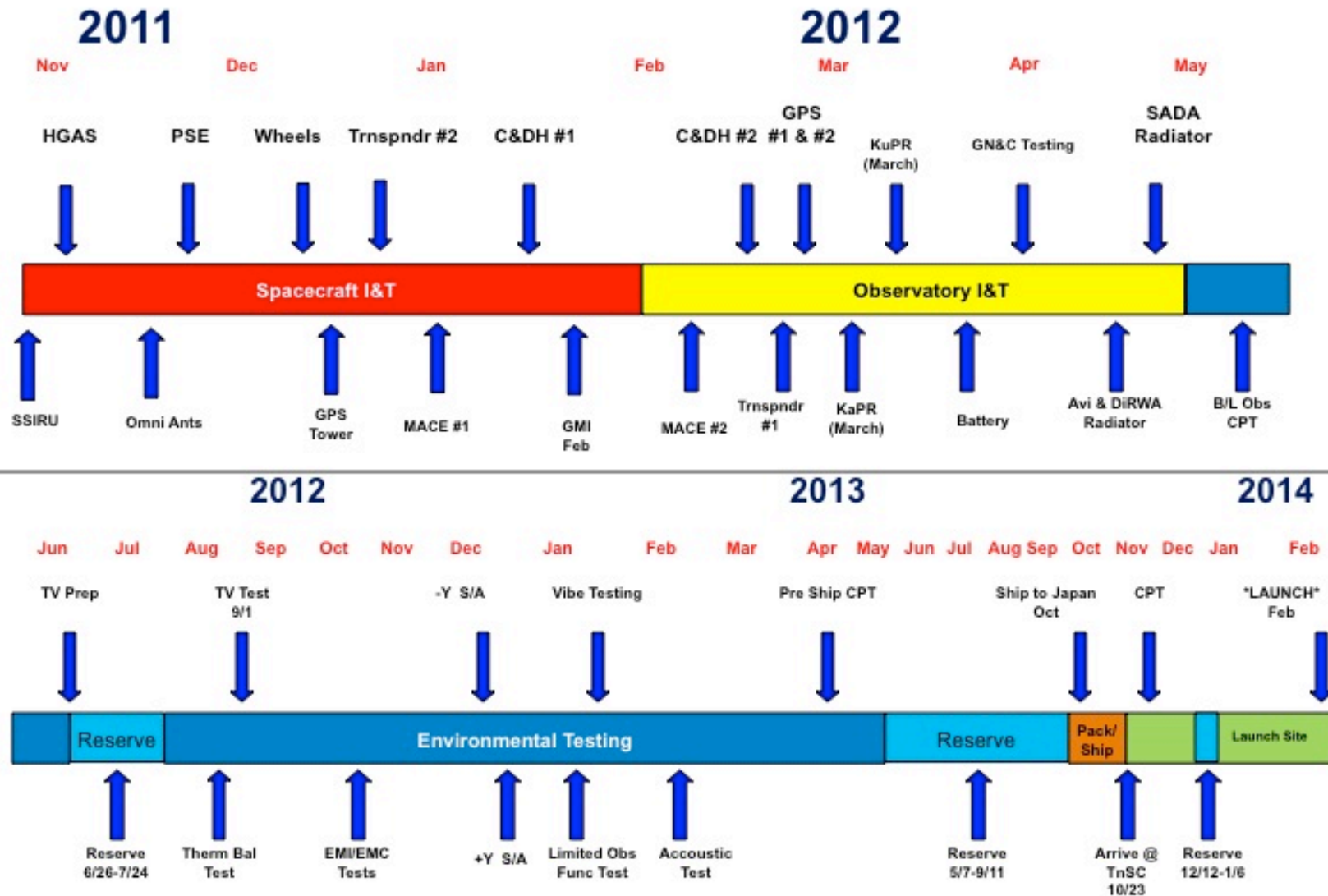
• **Good trend data**

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- **Dual-frequency Precipitation Radar (DPR, JAXA)**
  - JAXA has recovered from earthquake
  - DPR (Ka and Ku) completed environmental testing, rework/retest in progress; delivery to GSFC is planned for March 2012
  - Pre-Ship Review planned for January/February 2012 time frame



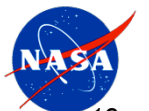
Status as of: 10/31/11



GLOBAL PRECIPITATION MEASUREMENT



Back-up





# GPM TV Test Configuration (Requires > 27' chamber)

