Moblas 8 Return to Operations

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International Laser Ranging Service

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Abstract

- The MOBLAS 8 station located on the island of Tahiti has been operational at that location since 1997. Recently, in 2007, the station suffered from multiple failures of components and subsystems. Due to the changeover of station personnel and the removal of HTSI from the island to help with the operations and maintenance in 2004, the multiple failures of the system caused the MOBLAS 8 system to be inoperable in March 2007. Working closely with NASA, CNES, and UFP, HTSI developed a training plan for the station manager from the Moblas 8 site as well as the TLRS-3 station manager from Arequipa, Peru. Following the training back at NASA's Goddard Space Flight Center (GSFC) in Greenbelt, Maryland, the MOBLAS 8 Station Manager worked with HTSI personnel to repair subsystems and components at GSFC. Later, two HTSI engineers traveled to the MOBLAS 8 station to work with the Station Manager and the UFP and CNES crew to complete the system and site repairs, resulting in the restart of operations at this critical site in the South Pacific. This paper chronicles the work that was planned and executed along with the benefits to the NASA, UFP, CNES and the ILRS with the repairs and efforts to return the station to operations.

Moblas 8 Background

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- Moblas 8 was re-deployed from Quincy, CA to Papeete, Tahiti French Polynesia in 1997 as part of NASA's Cooperating SLR program.
- Prior to the start of operations, the original French station manager was trained on SLR operations and maintenance in Maryland.
- HTSI technical staff was periodically stationed at Moblas 8 from 1997 to 2003.
- HTSI technical staff finally departed in 2003.
- Between crew turnover and no permanent HTSI presence, no solid technical knowledge of Moblas O&M remained on station.
- Through multiple failures the system went off-line with major MPACS
- issues in 2007.

Moblas 8 Timeline 1997 - 2001

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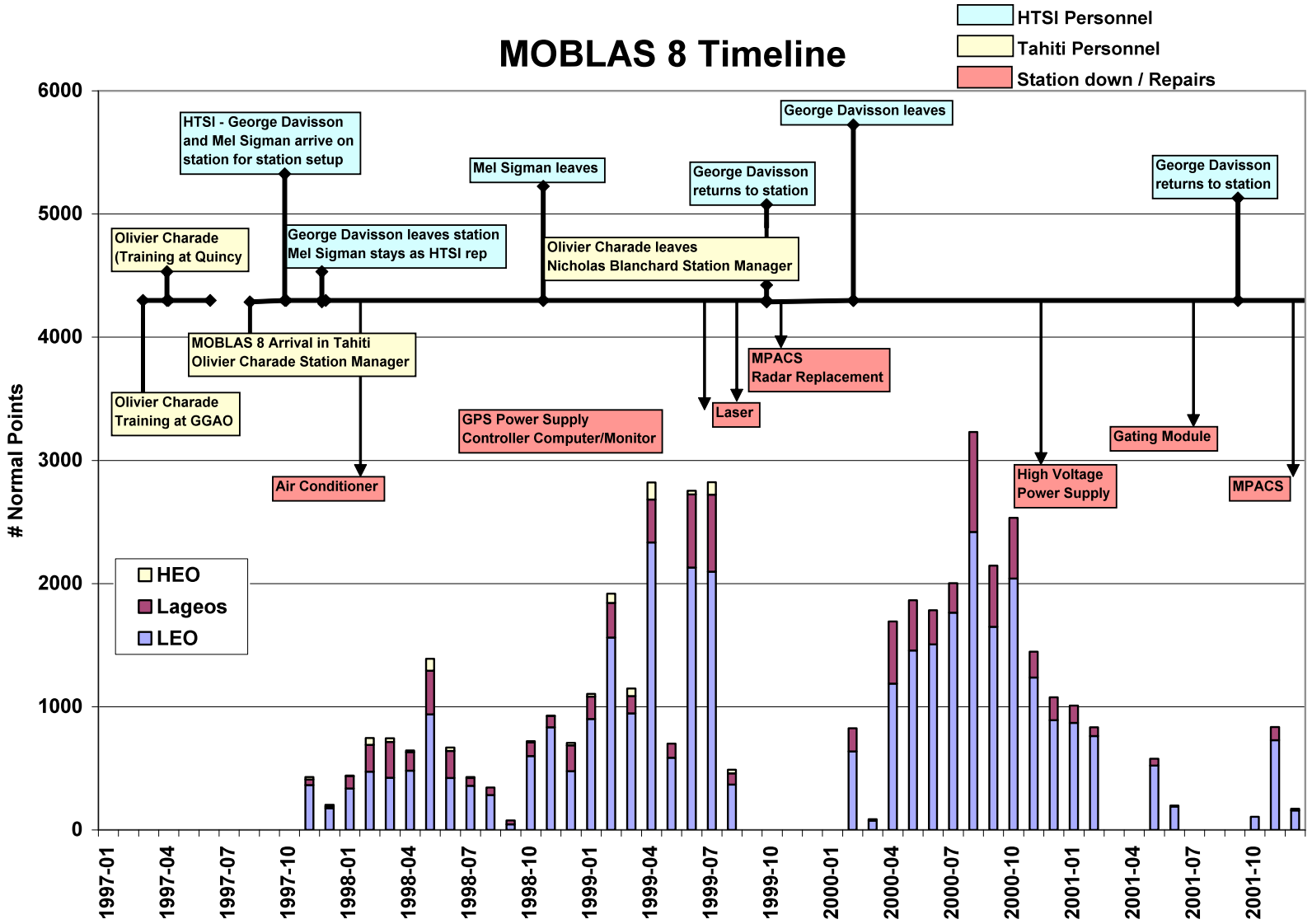

Moblas 8 Timeline 2002-2006

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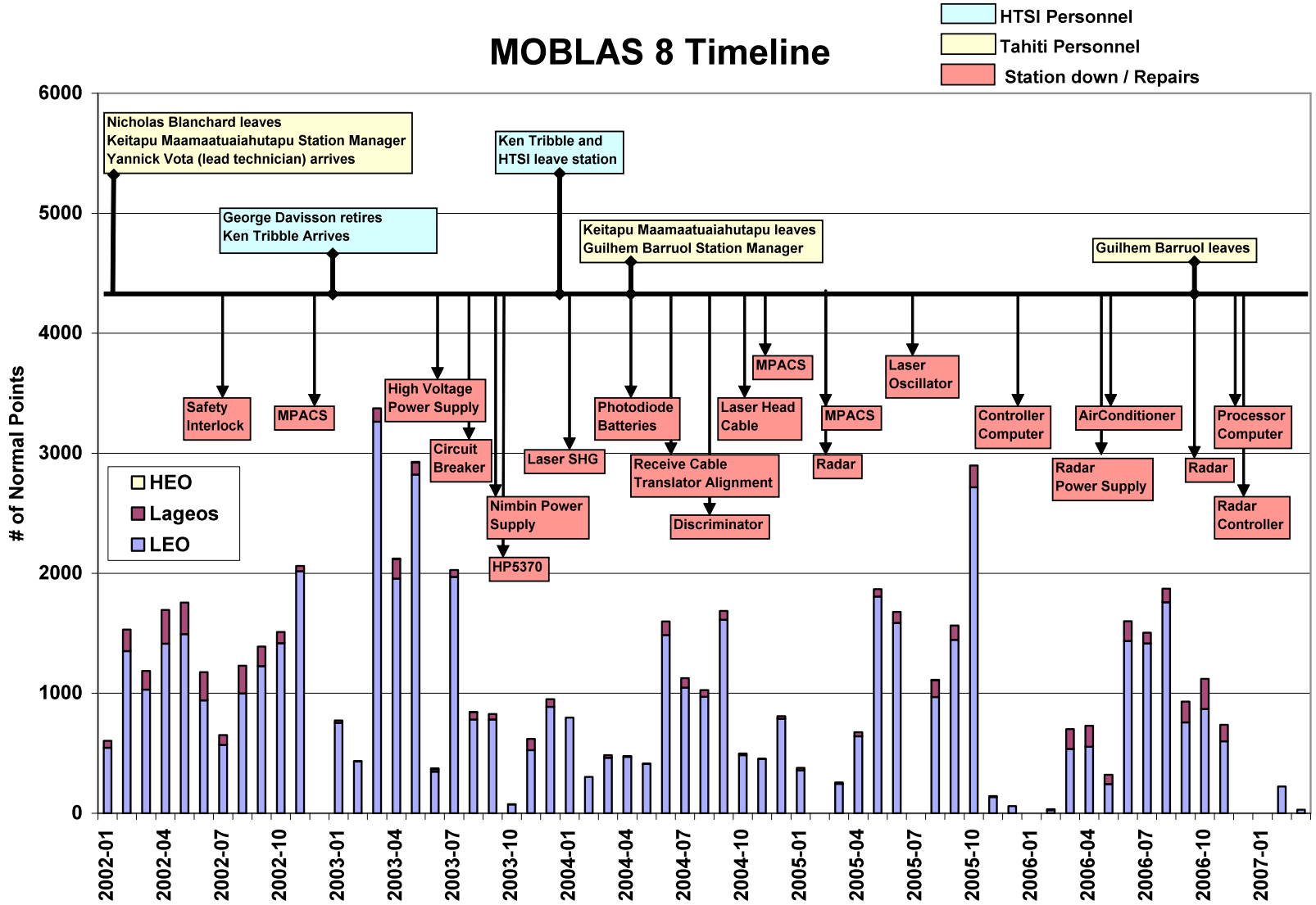

Moblas 8 Timeline 2007-2008

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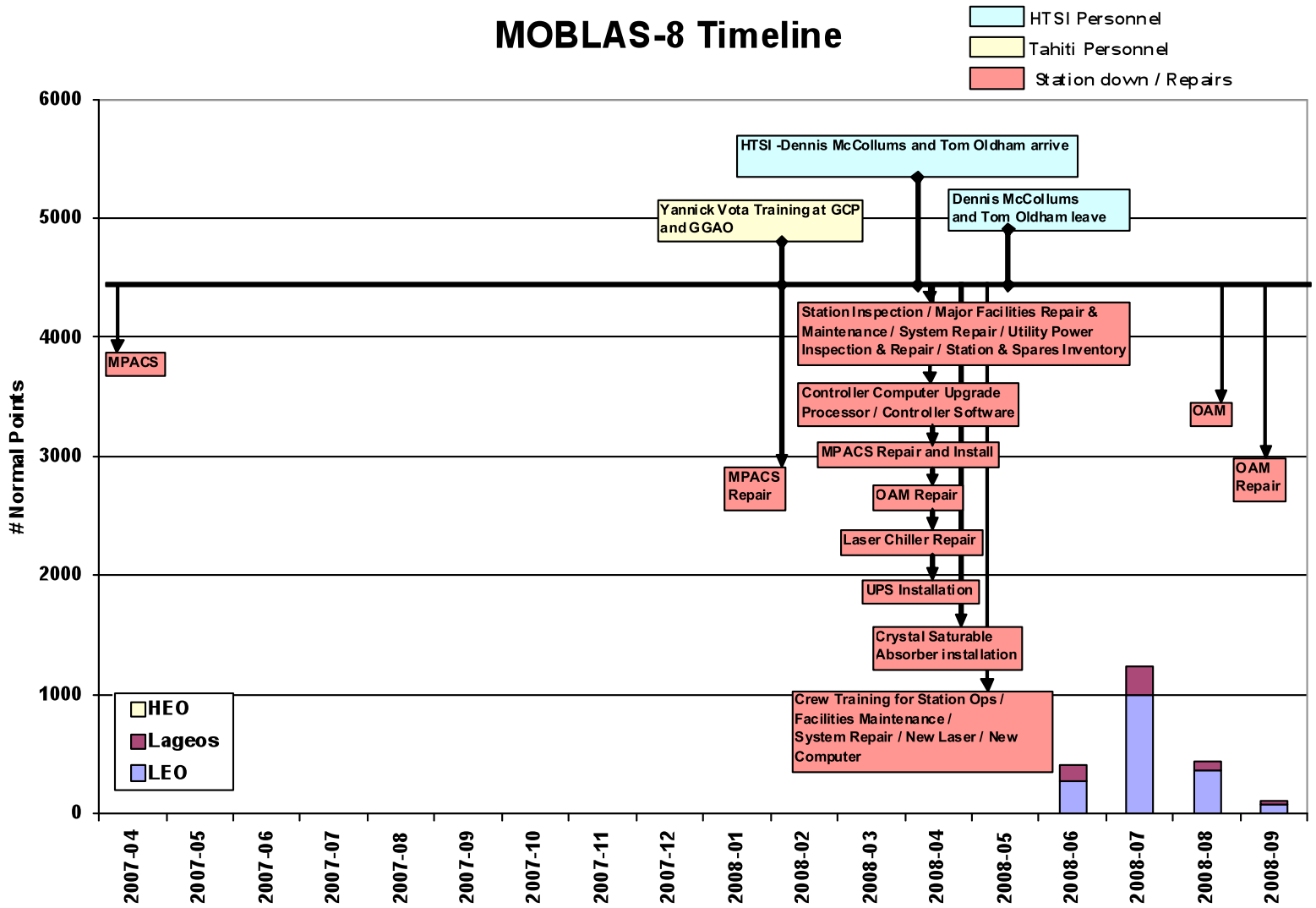

Repairs, Optimizations & Alignments Performed

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- In February 2008, the Station Manager traveled to HTSI for intensive training on subsystem, and component level repair and operations.
- Beginning in March 2008 HTSI sent two engineers to Moblas 8 to perform system repairs, upgrades and on-site training to the crew.
- Repairs to the system included:
  - Main system power cable, system ground cable, laser high voltage cables, laser main power cables.
  - Low loss Receive Signal cable evaluation and replacement
  - OAM, Daylight filter, ranging camera, MET-3
  - Optics repair/replacement and alignment
  - MPACS
  - Radar
  - HP5370B TIU
  - Console issues
  - Laser Chiller
  - Spares restocking
  - Multiple power supplies
  - Facilities repair and maintenance, including HVAC and all trailers

System Upgrades Performed

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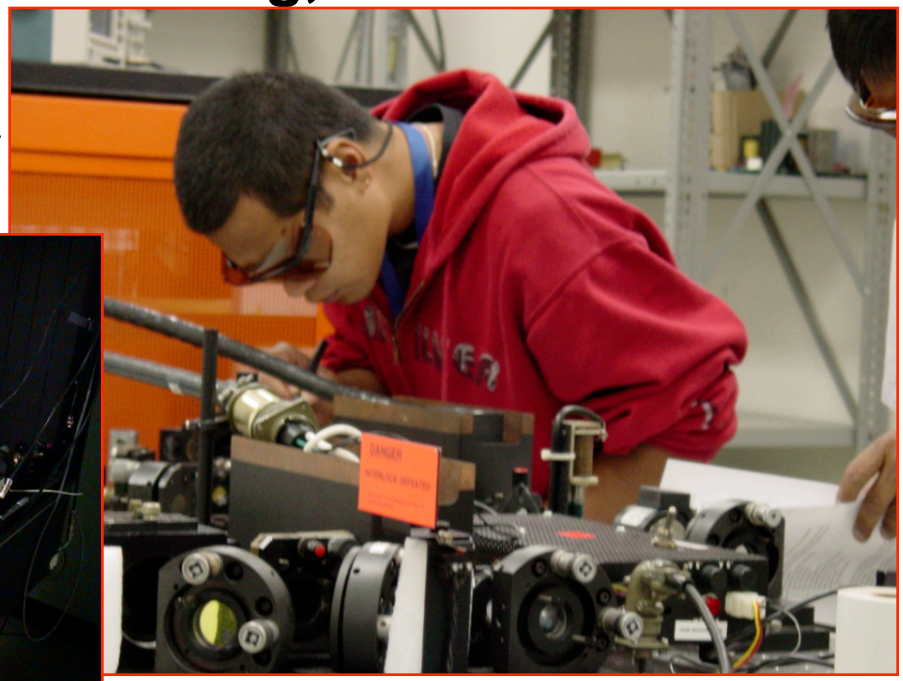
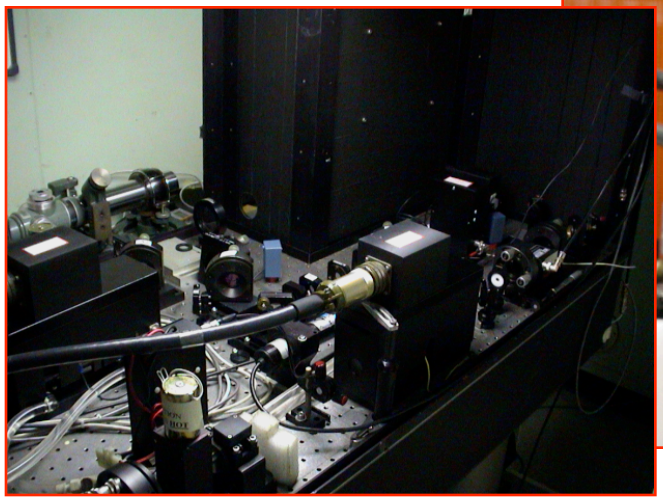
- Upgrades performed to the system included:
  - Saturable Absorber
  - Controller Computer including all software
  - Processor Computer software including Restricted Tracking, data processing, and CPF
  - Laser head cables
  - High Voltage power supply
  - O-scope





Results of the Repair / Upgrade Effort

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- Returned system to full operations following no operations for 18 months due to hardware failures
- Overall system performance was verified by performing LEO and MEO satellite passes, as well as performing several stability, CFD, and TIU verification tests.
  - Data quality was nominal with calibrations 4 – 5 mm RMS
  - LAGEOS passes 8 – 9 mm RMS. One LAGEOS pass netted 5,600 hundred returns with 8.3 mm RMS.
  - For the first time since 2003, tracked a HEO satellite the week of 9/29/08, the GLONASS 109, obtaining RMS values 10 – 15 mm.
- Number of observations per pass increased dramatically
- Crew now better trained with Station Manager receiving additional "hands on" training in Maryland

Post Effort Look at the Data - LAGEOS

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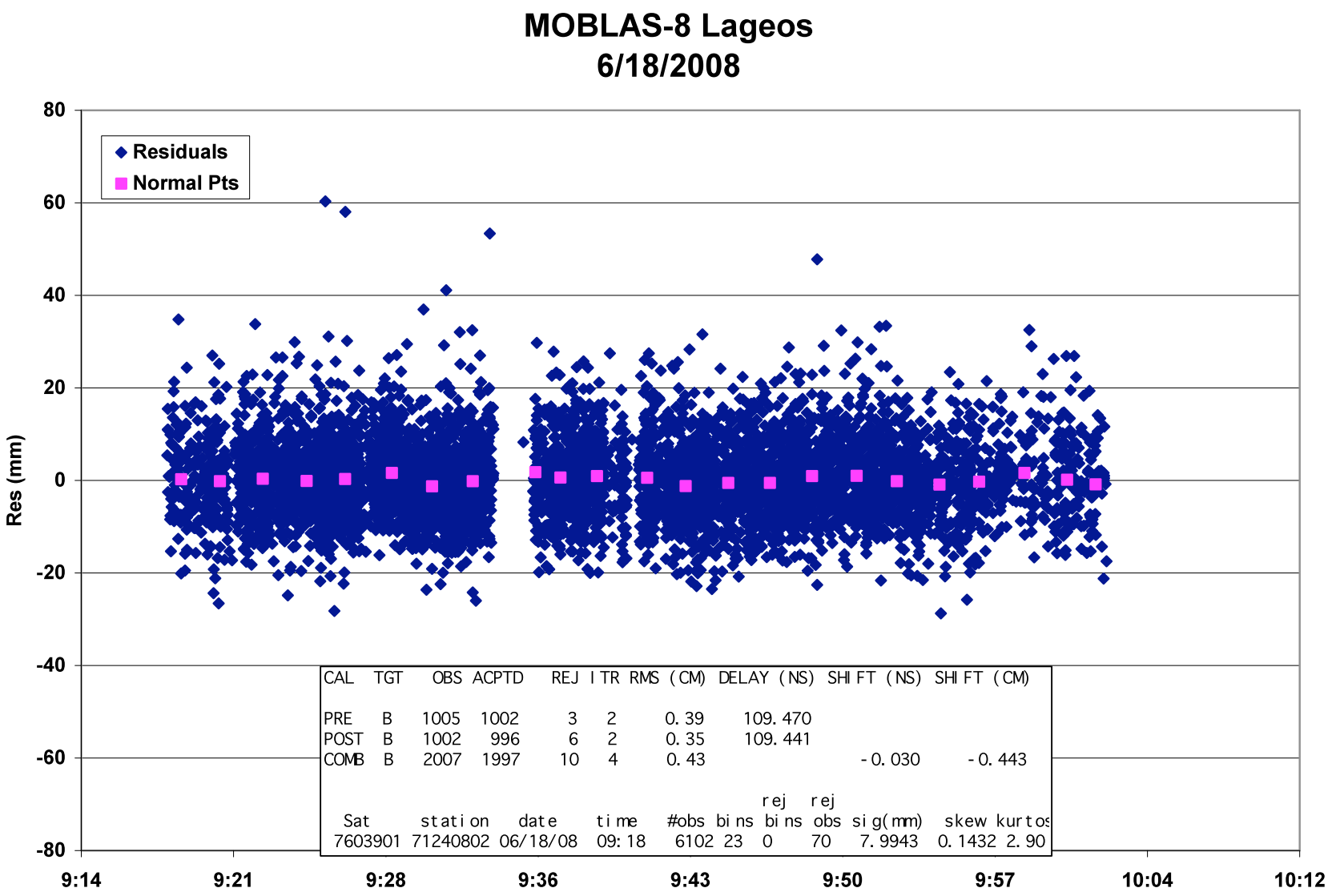

Post Effort Look at the Data - Jason

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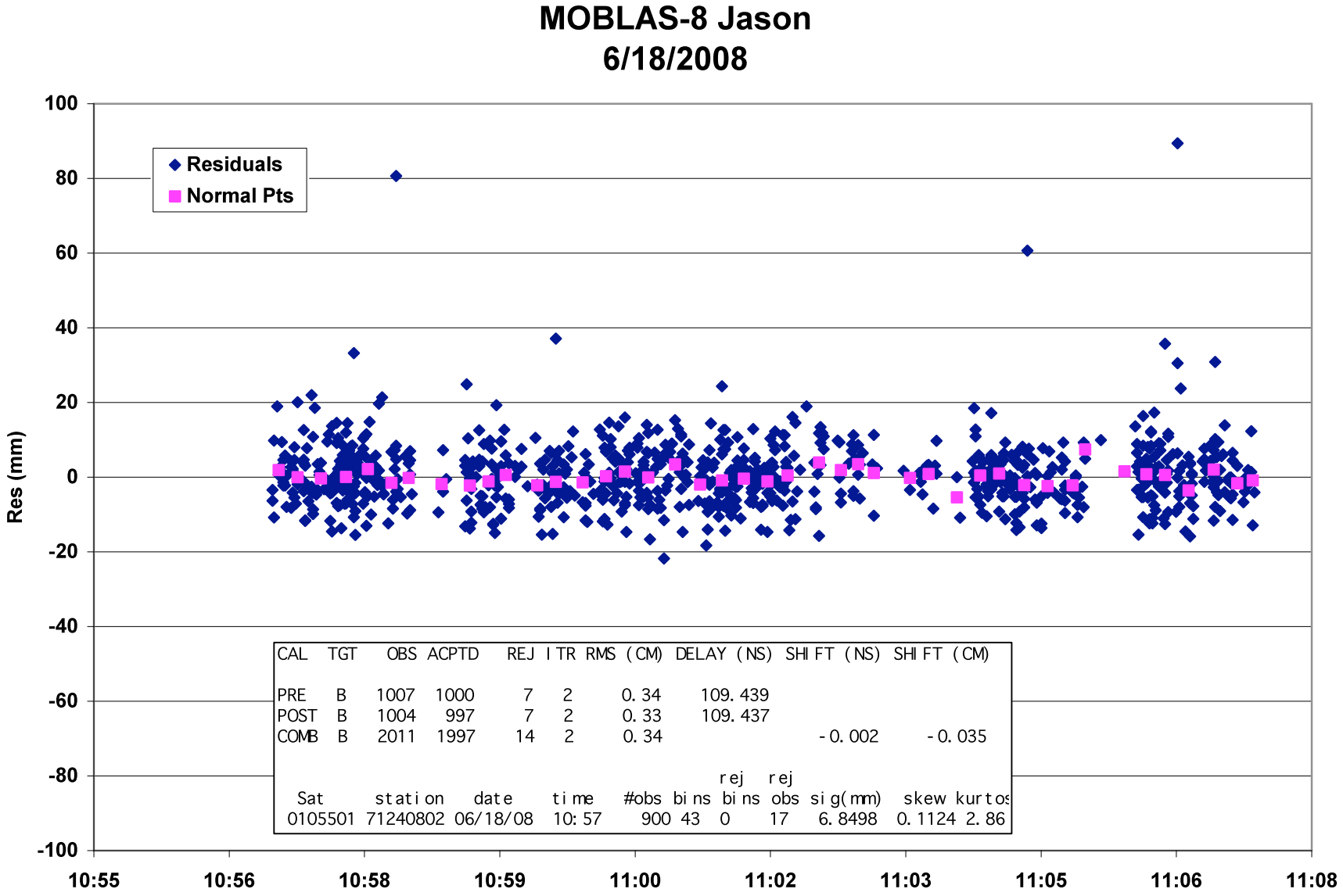

Items Remaining to Complete

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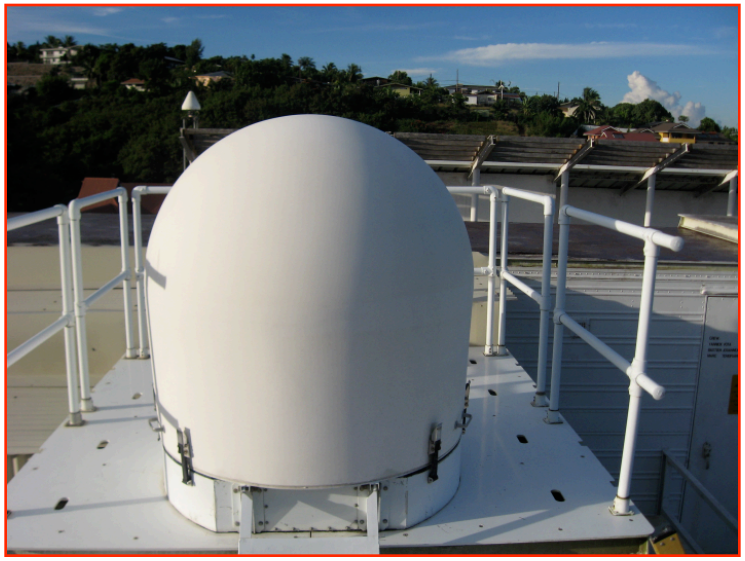
- Repair, align, and verify the Radar subsystem
- Repair and verify HSLR and HEO tracking abilities
- Verify system testing of the spare HP5370B TIU
- Verify tracking oscilloscope EC
- Assist with the new chiller installation
- Receive / review / provide feed back on the revised CNES design proposal for the HVAC system
- Complete the V Plate upgrade for the mount lower / upper revolution switch



Paradise is Getting Crowded !

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