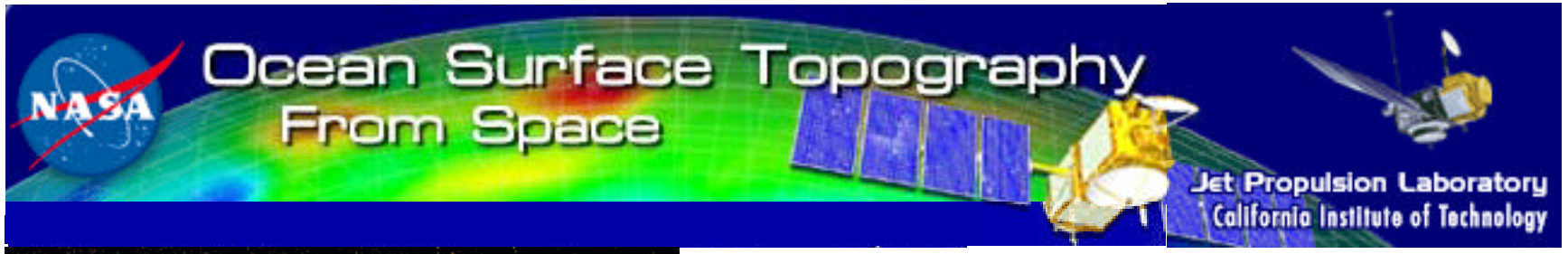


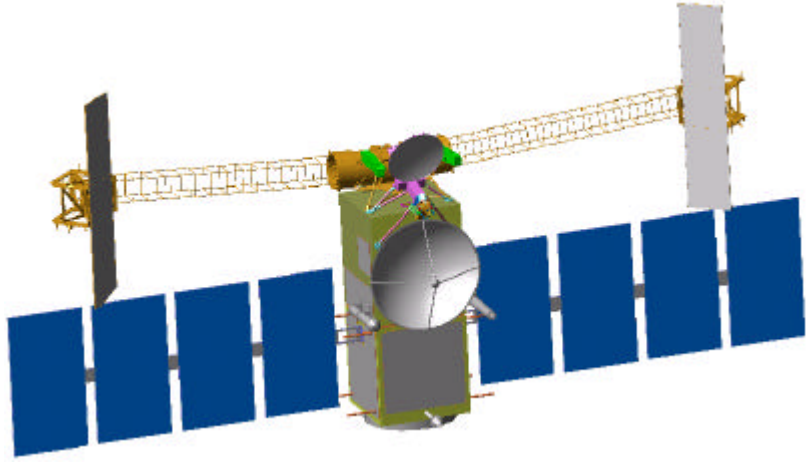
OCEAN SURFACE TOPOGRAPHY MISSION (OSTM) Status

Said Kaki

November 21, 2003

OSTM Core

OSTM Enhanced



Project Overview

Mission Objectives

- **Provide continuity of ocean topography measurements beyond Topex/Poseidon and Jason-1**
- **Continue partnership with CNES, as on Jason-1, with the addition of NOAA and EUMETSAT as operational partners**
- **Provide a bridge to an operational mission to enable the continuation of multi-decadal ocean topography measurements**

Science Measurements

Global sea surface height to an accuracy of ≤ 4 cm every 10 days, for determining ocean circulation, climate change and sea level rise

Instruments

- **Nadir Altimeter**
- **Microwave Radiometer**
- **GPS Receiver**
- **DORIS**
- **Laser Retroreflector Array**
- **Wide Swath Altimeter (Optional)**

Partnership Approach

NASA responsibilities:

- Project Management
- Launch vehicle
- Payload
  - Microwave Radiometer
  - Wide Swath Ocean Altimeter (Optional)
  - GPS Receiver
  - Laser Retroreflector Array
- GDR processing, archiving, and distribution

NOAA responsibilities:

- Ground system
  - Two Earth Terminals
  - Ground network
  - Project Operations Control Center (POCC)
- Mission Operations after commissioning
- Data processing, archiving, and distribution

CNES responsibilities:

- Project Management
- Proteus bus
- Payload
  - Nadir Altimeter
  - DORIS tracking receiver
  - WSOA TWTA
- Ground System
- System integration and test
- Mission Operations during commissioning
- Data Processing, archiving and distribution

Eumetsat responsibilities:

- One Earth terminal
- Operational product processing and distribution
- User interface

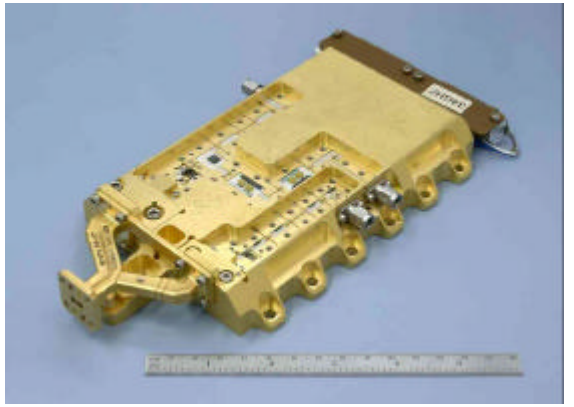
Changes since Jason-1

Programmatic Status

- **OSTM was approved by NASA as a new start in FY02**
  - **Launch date Oct 2007**
- **Same payload as Jason-1 with addition of WSOA if:**
  - **No additional risk to core mission**
  - **Compatible with Proteus Bus**
- **Held PDR for US provided instruments in February 2003**
  - **Core payload (AMR, GPSP, LRA) met all PDR success criteria, with no major issues identified and is recommended to proceed to implementation**
  - **WSOA instrument met all PDR success criteria, with some risks identified but is recommended to proceed to implementation**
    - **Accommodation of the WSOA by the Proteus bus.**

Advanced Microwave Radiometer

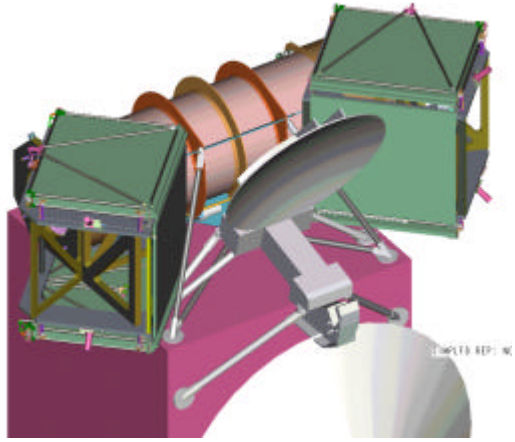
- **Completed detailed design of AMR electronics**
- **Completed electronics Engineering Model fabrication and functional testing**
  - ⇨ **All functional requirements met**
  - ⇨ **Detailed performance test have started**
  - ⇨ **CDR Planned in January 2004**
- **New reflector design evaluated:**
  - ⇨ Unable to validate performance pre-launch
  - ⇨ Lengthy on orbit calibration
  - ⇨ Jason Reflector design is over 30 years old
- **Implementation of new reflector on hold until WSOA decision**



RF Chain

Digital and Power supply

JMR Reflector

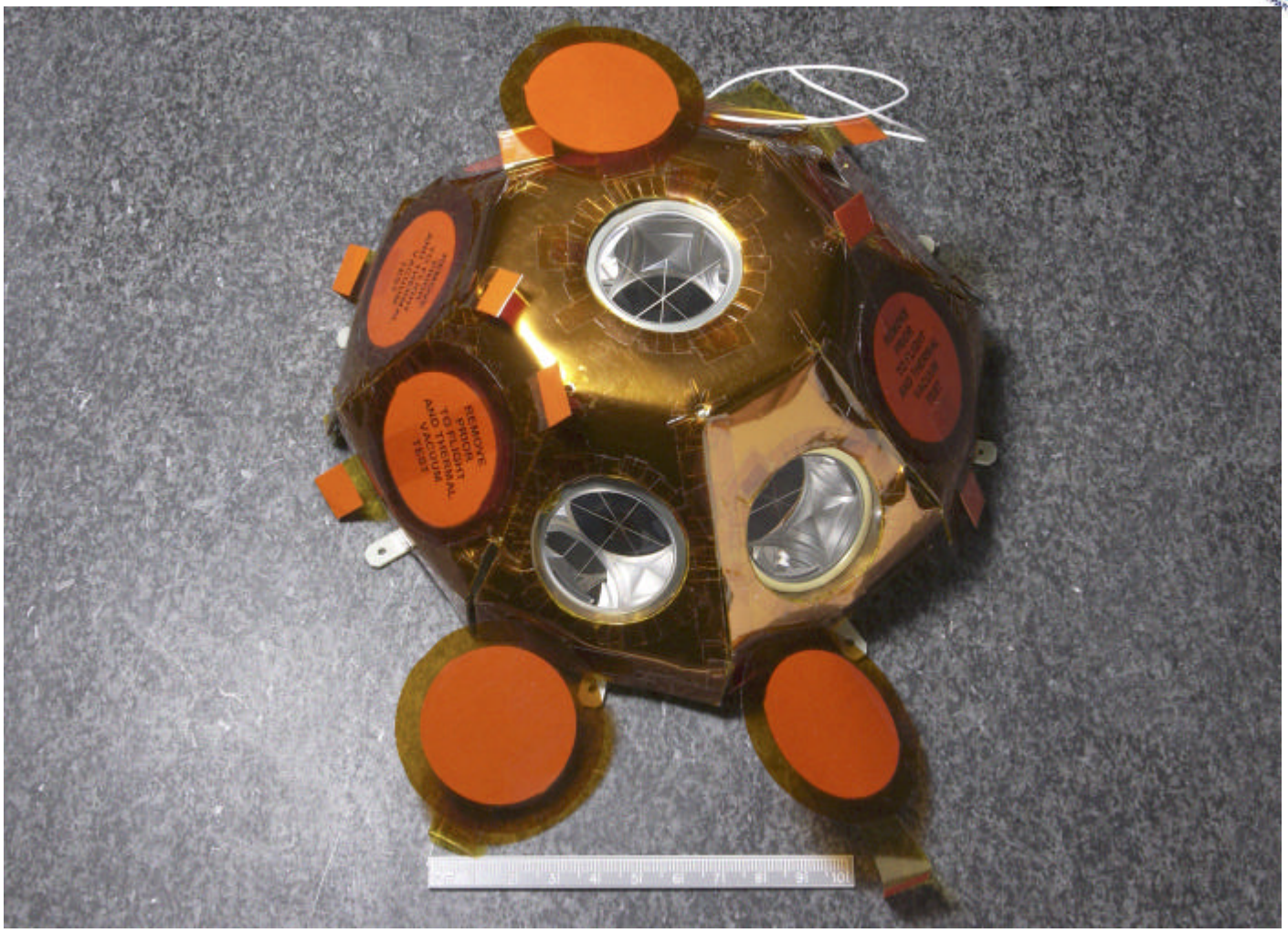


New Reflector

GPS Status

- OSTM will fly an exact copy of the Jason-1 TRSR
- EM unit (Jason-1 spare) available
- Initiated contracts with Spectrum Astro
  - Long lead items contract in place since July
  - Contract for fabrication, test, and qualification of 2 flight units negotiated
- Will use exact copy of latest version of Jason-1 TRSR flight software

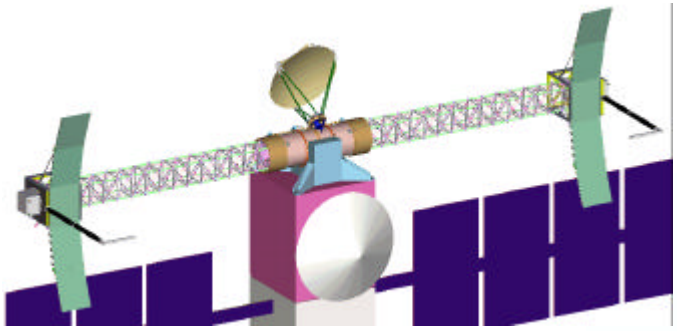
LRA



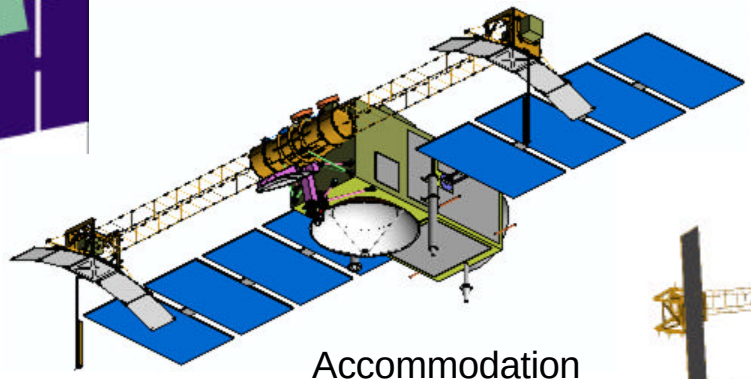
OSTM FM LRA fabrication and qualification completed

WSOA Status

- **Successful PDR held in February 2003. Mechanical accommodation of WSOA on Proteus identified as most significant risk**
- **Initiated accommodation study with Alcatel. Preliminary results look promising**
- **Modified WSOA design (offset feed) to further reduce mass and lower CG**

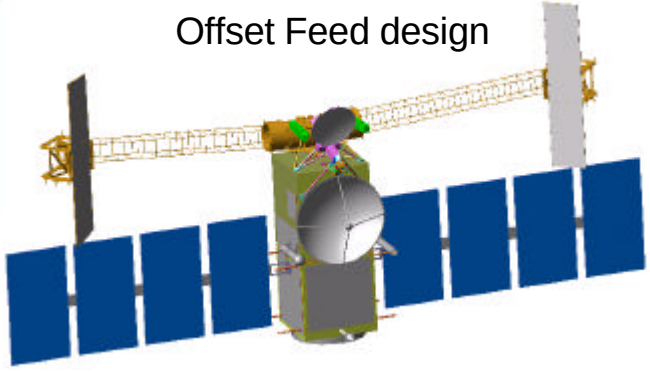


PDR Design



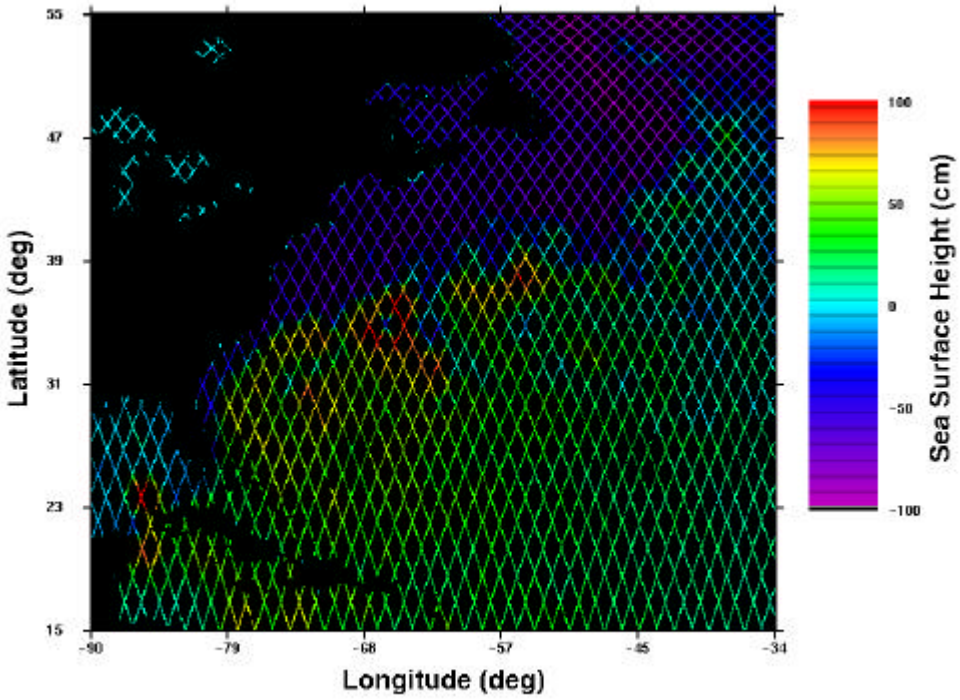
Accommodation Configuration

Offset Feed design

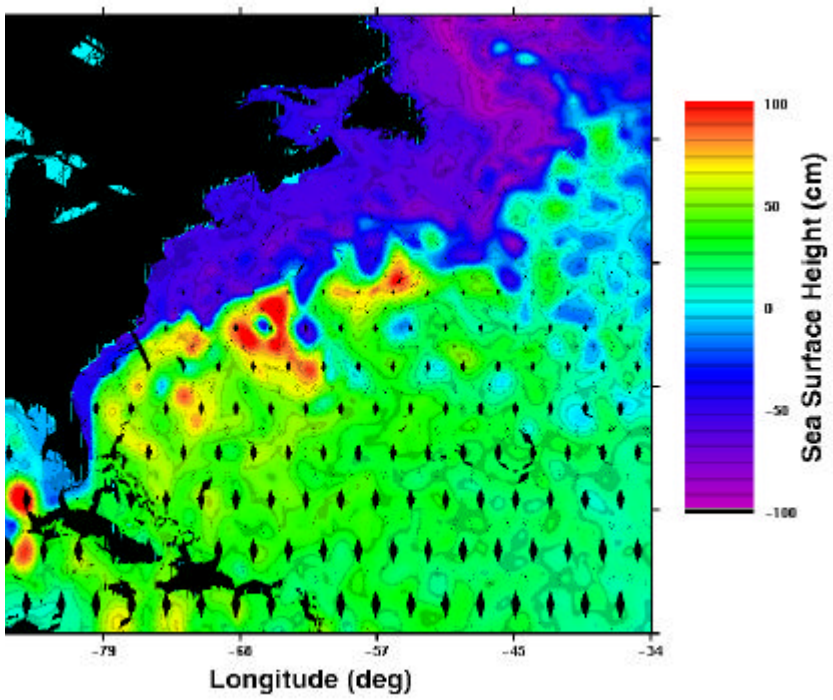


WSOA Science Rationale

Jason Orbit, 2 Altimeters:
150km equatorial spacing, 10 day repeat



Jason Orbit, 1 satellite, fixed yaw coverage
Wide-Swath altimeter, 10 day repeat



High resolution ocean topography measurements requires several coordinated nadir altimeters. A better coverage from a single platform can be obtained using an instrument which can image a swath instantaneously.

Launch Vehicle

- **Baseline is a Delta II launch vehicle with same launch configuration as Jason-1**

- **Pursuing US Navy (NRL) sponsorship of a DoD contributed launch vehicle under the Space Test Program (STP)**
  - ⇨ **STP is set up by the DoD and managed by the Air Force, for sponsoring space demonstration experiment**
  - ⇨ **WSOA is the experiment sponsored by the US Navy**
  - ⇨ **Presented OSTM to 2002 DOD Space Experiment Review Board (SERB). OSTM was ranked 9th out of 47 experiments**
  - ⇨ **Continuing to support yearly SERB process**
    - **OSTM ranked 2nd during Navy July 2003 SERB**