The NASA EV-2
Cyclone Global Navigation Satellite System (CYGNSS) Mission Status

Randy Rose (SwRI)
rrose@swri.org  303-588-2157
We know where they’re going, we don’t know what they’ll do when they get there!

Tropical cyclone track forecasts have improved in accuracy by ~50% since 1990, largely as a result of improved mesoscale and synoptic modeling and data assimilation. In that same period, there has been essentially no improvement in the accuracy of intensity forecasts.

Existing Observatories have Gaps in Their Science Coverage

- Most existing spaceborne ocean wind observatories located in near-polar low Earth orbits
  - Maximize global coverage
  - Result in large gaps in coverage and low sample rates
- Use active radar systems
  - Require significant power for pulse transmission
  - Require large aperture antennas
  - C- and Ku-band signals are obscured by heavy precipitation
CYGNSS Orbit was Chosen to Enhance Coverage of Tropical Storm Development

CYGNSS Coverage area versus Historical Tropical Storm Track Overlay

CYGNSS coverage map overlaid on historical record of all named (wind speed >30 kt) storm tracks during 2000-2009. Red indicates Cat 1 or higher TC.
Observatory Configuration

- Power: 38.3 W
- Pointing
  - Star tracker based attitude knowledge, 3-axis reaction wheel stabilized
  - 1.3 deg (3σ) attitude knowledge
  - 2.2 deg (3σ) attitude control
- Mass: 29.0 kg (with 4kg ballast)
CYGNSS in Action!
Observatory Launch Configuration (Solar Arrays Stowed)
Observatory Flight Configuration
(Solar Arrays Deployed)
Thermal Vacuum Testing is Underway

Observatories #1-4 installed in TVac Chamber

TVAC installation for Observatories #1-4
All Observatories Integrated with Deployment Module for Vibration Test
Observatory during Ultra-Low EMI Test
Ground Segment Elements

Ground Data Network (USN)
- Comm scheduling
- Data Downlink
  - Sci Data Files
  - Eng Data Files
- Command uplink

Mission Operations Center (SwRI-Boulder)
- Mission Planning
- Flight Dynamics
  - Contact Scheduling
  - Constellation Management
- Contact Control
- Constraint Checking
- Command Generation
  - Real Time
  - Sequences
- Raw Data Archive

Science Operations Center (UM)
- Science Data Files
- Engineering Data
- Instrument Data
- Command Requests

CARA (NASA RSPP)
- Space object conjunction prediction and coordination

PO-DAAC (NASA)
- Science Data Files
- Ancillary Data
- Science Data Code

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CYGNSS is GO for Launch!!

• Additional information:
  – Find us (Randy Rose or Debi Rose) at the SwRI booth (57-58)

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Questions?

Co-Authors
Dr. Chris Ruf, Univ of Michigan
John Scherrer, Debi Rose, SwRI
Jim Wells, NASA-LaRC
Christine Bonnikesen, NASA-HQ

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