TODWL and other Navy airborne wind lidar plans including nocturnal flight plan in November

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TODWL Plans

- Skywalker flights in November,2007
  - Nocturnal atmospheric advantages for autonomous UAV flight control
- Possible nocturnal flights as part of Army SBIR project ADLAATS (Airborne Doppler Lidar Analysis and Adaptive Targeting System)
- Possible Smart Towed Platform experiments at night.
- Preliminary test flights of Navy funded ILIMMS (Integrated Lidar Mission Management System)

NRL P3 DWL for T-PARC

- ONR (Ron Ferek) has committed to installing a replication of TODWL on NRL's P3.
- Intention is to support the 2008 T-PARC with an airborne combination of a DWL and Doppler radar (NCAR's ELDORA)

ELDORA on NRL P3

ELDORA Characteristics

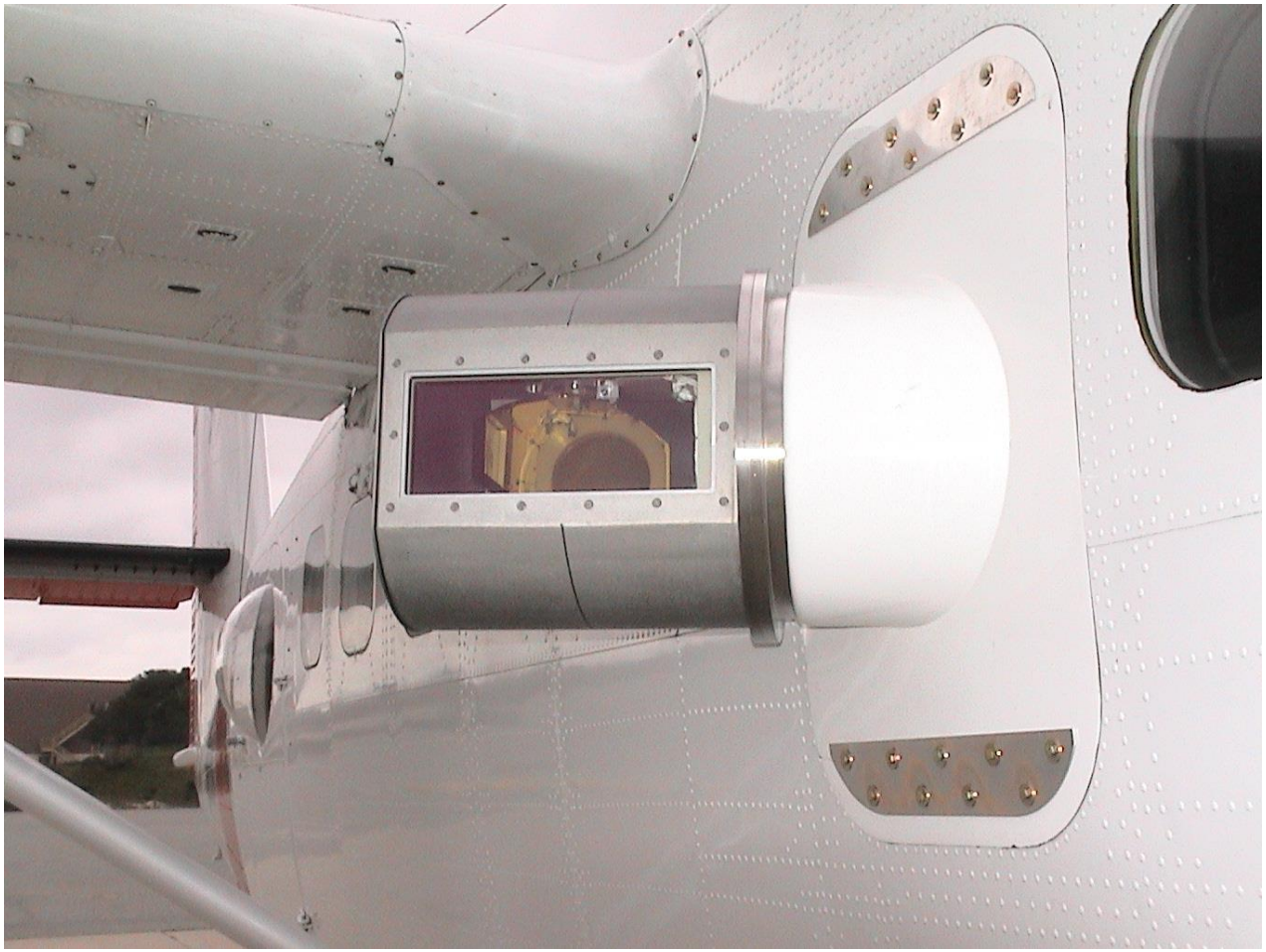
Number of Radars	2 (fore and aft)
Wavelength	3.2 cm
Transmit Frequency	9.3 - 9.8 GHz
Beamwidth (circular)	1.8 °
Antenna Gain	38.7 dB
Polarization (00 elevation)	horizontal
First Sidelobe Power	-35 dB
Beam Tilt Angle (fore and aft)	± 15-19 °
Antenna Rotation Rate	5-144 °/s
Dwell Time	7-50 ms
Rotational Sampling Rate	0.75-2.00 °
Peak Transmitted Power	35-40 kw
Receiver Bandwidth	0.5 - 4.0 MHz
Receiver Temperature (at antenna)	<600 °K
Pulse Repetition Frequency	2000-5000 Hz
Minimum Detectable Signal (at 10 km)	-12 dBZ
Unambiguous Range	20 - 90 km
Unambiguous Velocity (single PRT)	± 13 - 20 m/s
Unambiguous Velocity (dual PRT)	± 80 - 110 m/s
Number of Frequencies	4
Pulse Chip Length	0.25 - 3.00 μs
Range Averaging	1-4 gates
Total Cell Length	37.5 - 1200 m
Along Track Sweep Spacing	0.3 - 1.0 km

P3 DWL

- Use existing subsystems where possible
  - Transceiver, prior TODWL MAG1 or MAG1 from ARL (Dave Ligon)
  - Data system and PEU from prior TODWL
  - Bi-axis scanner currently at NASA/LaRC
    - Only other copy of the TODWL scanner
    - Mount scanner “backwards” to avoid P3 high wings
- Outstanding issues
  - Door mounting of scanner
  - Certification of scanner of P3 installation

The instrument

- 2µm coherent detection
- 4-6 mJ (330 nsec pulse) (NEW: 2 mJ)
- 80 Hz (NEW: 500Hz)
- water cooled (NEW: heat exchanger)
- ~7-10% total system efficiency
- 10 cm two axis scanner, side door mounted
- GUI with realtime instrument control and data display
- Weight: 850lb Power: 750watts



TODWL 2-axis scanner

Starboard rear window

Schedule

- October
  - Final installation plans
  - Checkout of systems (pre installed)
- January
  - Installation and pre-flight checkout
- February
  - Check flights near Pax River
- WSR participation TBD.