

Combining TODWL with Smart Towed Platform for unique investigation of the marine atmospheric boundary layer

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Lidar Working Group Meeting

Snowmass

July 17 – 20 2007

Objectives

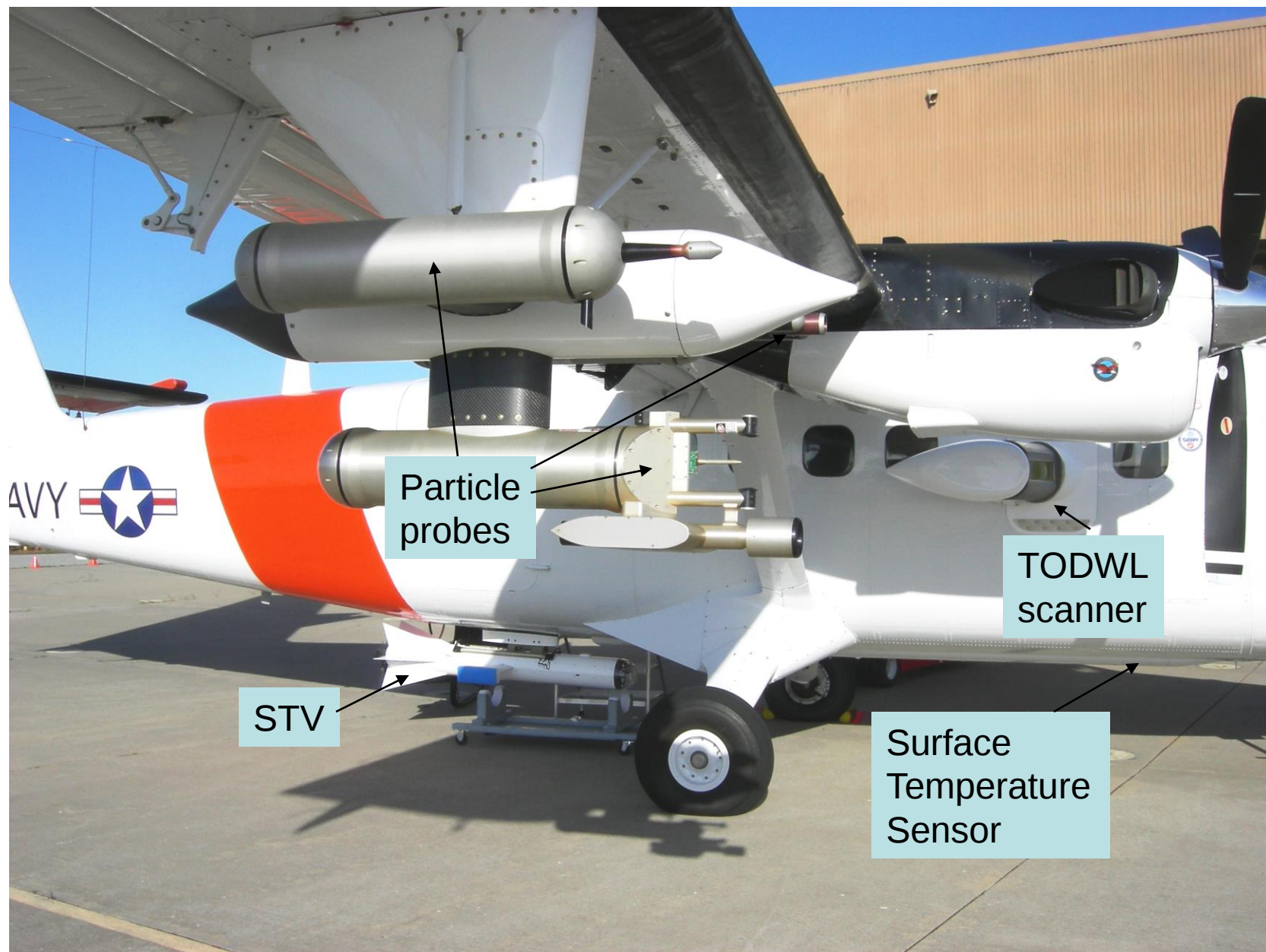
- Use a flux measuring platform suspended from aircraft to obtain second level of observations to study energy budgets within the Marine Boundary Layer.
- Use a Doppler Wind Lidar to obtain winds and aerosol distributions between the observation levels (aircraft flight level and towed platform level)
- Use DWL data to position platform and select aircraft headings for optimal intercepts of MBL features of interest

Background

- Smart Towed Platform funded as SBIR project for CIRPAS. PI's were Carl Friehe and Djamal Kehlif of University of California Irvine.
- TODWL developed with joint funding from ONR and NPOESS
- First co-flights conducted in April 2007
 - 30 hours flight time all over water

Specific Targets

- TODWL/STP targets included:
 - OLEs
 - MBL jets
 - Coastal transitions
 - Multilayer situations



NAVY



STV

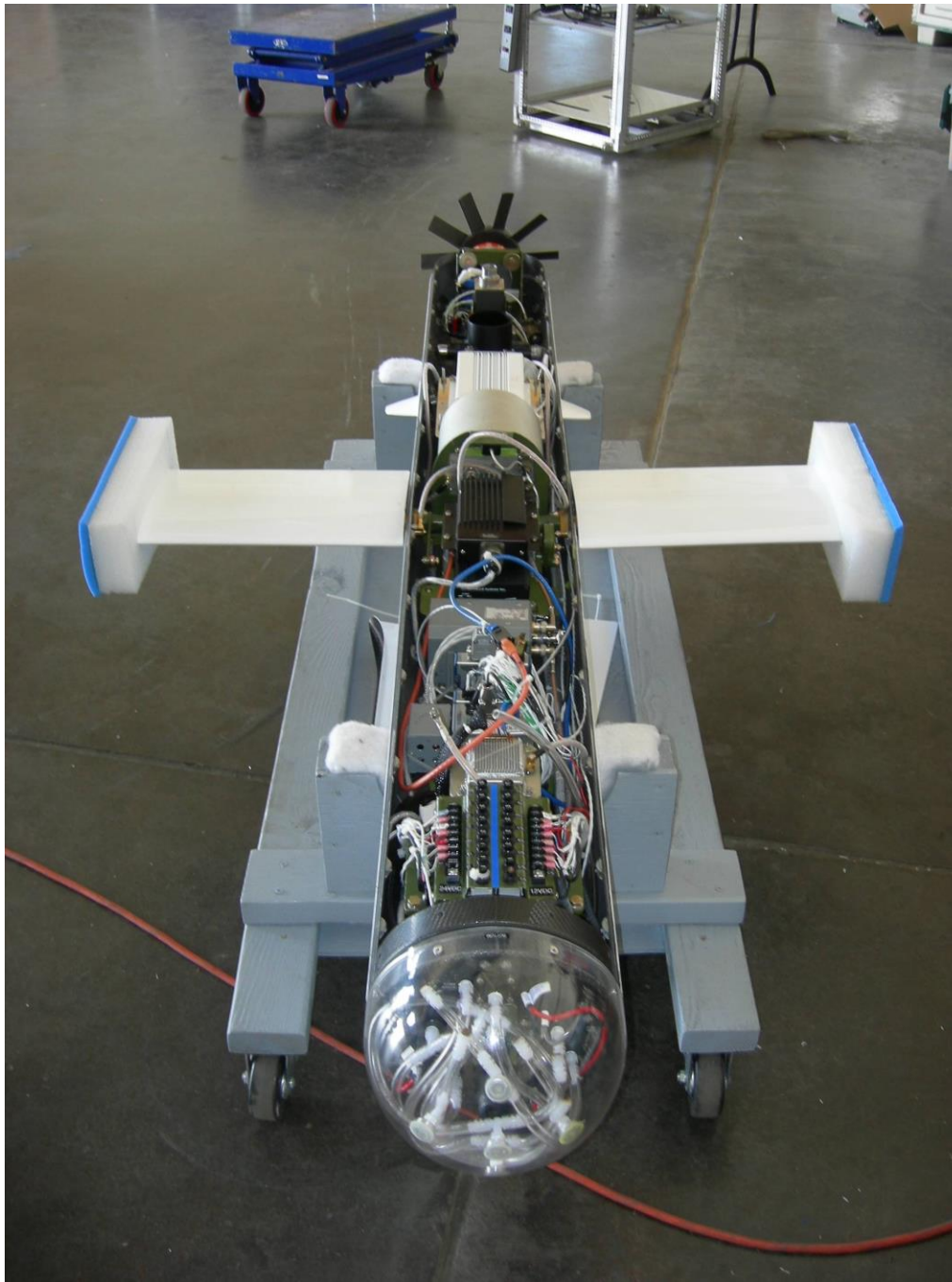
Particle probes

TODWL scanner

Surface Temperature Sensor

STV attached to Twin Otter

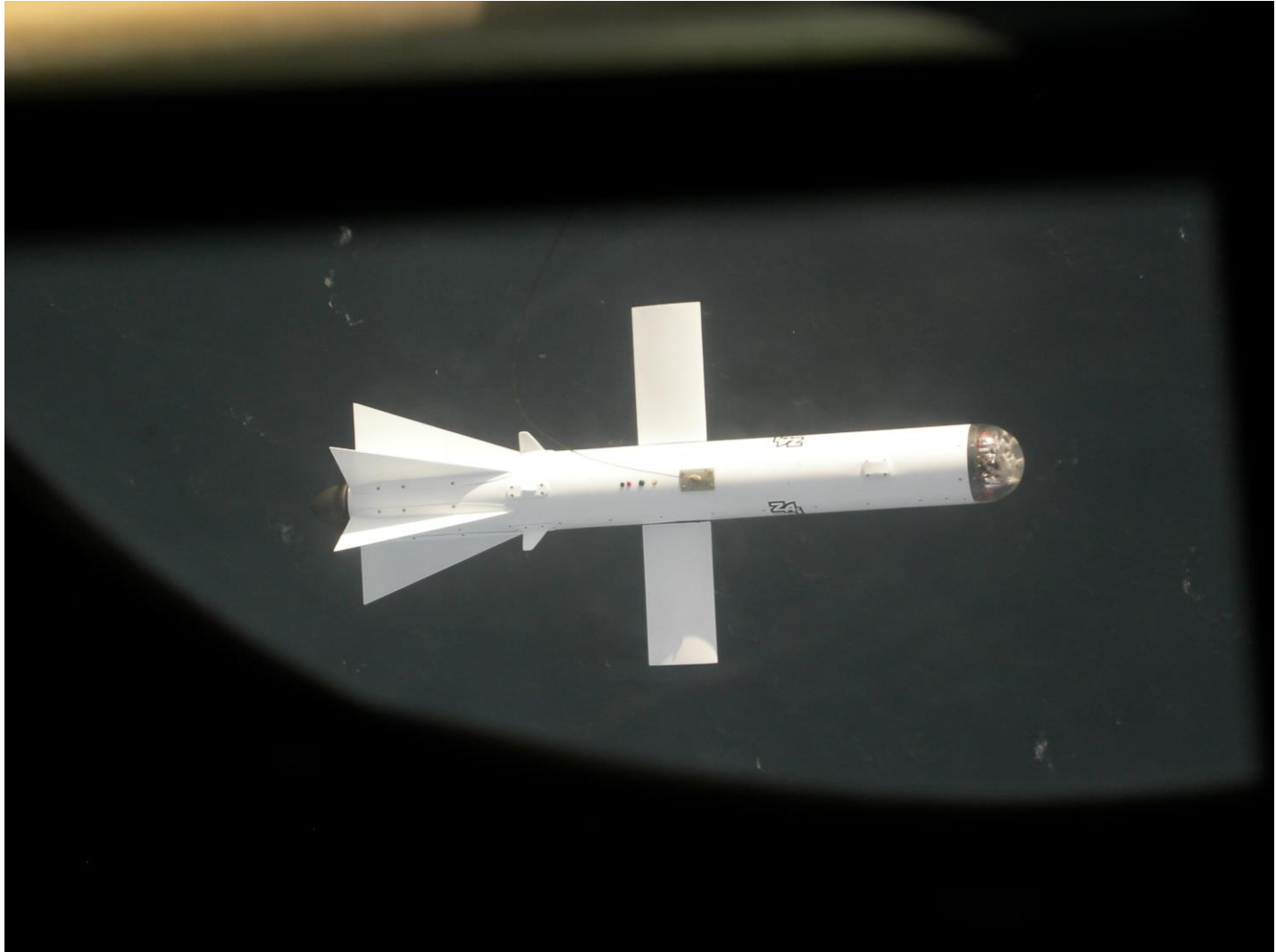




Smart Towed Platform

Temperature
Relative Humidity
Winds (gust)
GPS
Proximity radar
Cruise missile flight control

Smart Towed Vehicle





Smart Towed Vehicle

Converted Cruise Missile

With flux sensors

Courtesy of Carl Friehe

Plans

- Complete analyses of '07 data
 - Very interesting conditions near shore
 - First time ever having fluxes near ($\sim 10 - 30$ m) ocean surface with wind structure context provided by DWL
- More flights are planned for Spring '08
- Possible flights at night over water