

1st Meeting of WVIOP 2000 (18 September 2000)

1. Goal: Resolve lower tropospheric water vapor absolute calibration issues

(Upper tropospheric emphasis to follow during AFWEX, 27 Nov – 15 Dec 2000)

2. Hypotheses guiding approach for the lower atmosphere

- A. Microwave observations of the 22 GHz water vapor line can accurately constrain the total column water vapor amount (assuming a calibration accuracy of better than 0.5 C or 0.35 mm integrated water vapor), because the necessary absorption line parameters are well known from Stark Effect laboratory measurements
- B. Continuous profiling by Raman lidar provides a stable reference for handling sampling problems and observes a fixed column directly above the site, only requiring one altitude-independent calibration factor
- C. Chilled mirror hygrometers and capacitive in-situ sensors have the accuracy necessary to provide a solid rock to stand on near the surface (at the ground level, 25 and 60 m levels on the tower)

3. Key IOP-specific Instrumentation

Max-Planck Institute (Germany) ground-based water vapor DIAL lidar

Observing strategy: Zenith water vapor profiling (self calibrated)

NASA/GSFC scanning Raman lidar

Observing strategy:

- (1) The primary scanning mode is to scan tower altitudes to transfer calibration from the tower in situ sensors to a total column value using scaled Raman profiles. This will also include a series of zenith views to allow full tropospheric profiling (including upper tropospheric comparison with CRL for AFWEX).
- (2) A secondary mode is to scan in a plane coincident with the other microwave radiometers during selected clear sky periods to study homogeneity issues associated with the TIP calibration procedure.

NASA/JPL microwave radiometer (J-unit)

Observing Strategy: Continuous TIP calibration curves and LN₂ blackbody calibrations collected during clear sky periods for brightness temperature comparisons to MWR.

NOAA/ETL new microwave, Circularly Scanning Radiometer (CSR)

Observing Strategy: Continuous TIP calibration curves and LN₂ blackbody calibrations collected during clear sky periods for brightness temperature comparisons to MWR.

GPS water vapor (JPL at CF, NOAA at Lamont)

Observing Strategy: Continuous operation

Special Sonde launches

Observing Strategy:

Dual sondes every 3 hours from CF, with prescribed mixtures of Vaisala RS80s from four batches and new RS90s

3 Hourly launches from Boundary Facilities will begin 25 September for SCM IOP

Chilled mirrors (Sonde launch site, 25m and 60m Tower levels)

Observing Strategy: Continuous operation Vaisala Sonde and In Situ Sensor calibration checks

Data Plane (Temperature, RH, P)

Observing Strategy: Flights of opportunity from the ground to 1 km to tie ground/tower observations to lidar profiles

NASA/Ames 6-channel Sun Photometer (AATS-6)

Observing Strategy: Continuous daytime operation

**Proteus High-altitude Aircraft: Microwave (NAST-M), IR (NAST-I) FarIR (FIRSC)
(High Spectral Resolution IR Spectra and multispectral microwave observations)**

Observing Strategy: Flights of opportunity over CART site for lower and upper level water vapor retrieval and spectroscopy validation.

**Holographic Airbornes Rotating Lidar Instrument Experiment (HARLIE)
(Technology demonstration for Cloud and Aerosol observing)**

GLOBE Photometer (for NASA GIFTS Education and Public Outreach)

Observing Strategy: Infrequent daytime sampling for calibration

4. ARM Operational Systems

BBSS	Dual sondes as described above
Raman Lidar	Normal operation
In Situ	Normal operation of Tower, SMOS and THWAPS
MWR	Normal operation (continuous TIP calibrations in clear sky)
AERI	Normal operation
MPL	Normal operation for cloud detection
MFRSR	Normal operation with special intercomparisons

5. WVIOP Logistics

Web Page: <http://arm1.ssec.wisc.edu/~waynef/wviop2000>

Overview information

Daily Summary Reports (by Lead Scientist)

Daily quicklooks (Input encouraged, *dave.tobin@ssec.wisc.edu*)

Forecast material

Past IOP quicklooks

Data access information

R1 (local workstation for data access): r1.sgp.arm.gov

Near real time ARM data access and temporary IOP data repository.

Limit your processing and bandwidth.

Teleconference Access to Daily Science Meetings:

Daily Meetings at 2pm (~1 hr or less duration):

Informal discussion of observations and findings

Instrument status

Forecast

Daily Operations:

Continuous operations for applicable instruments.

Focus times: 4 pm to midnight