Motivations

Transfer Standard
- to compare and connect data from past, present and future sonde systems

Calibration & QC Tool
- for operational radiosondes and for many remote sensing systems

Sensor Test Bed
- to facilitate the development of new sensors

Research Tool
- in a variety of weather and climate programs

Climate Monitoring System

First step: Exploring balloon-borne TDL technology for in-situ water vapor measurements with verifiable high accuracy

Rationale: Strong need for a reference sonde system, but the greatest challenge is to find a reference-quality humidity sensor.

Goal: To explore balloon-borne TDL (tunable diode laser) technology for in-situ water vapor and CH4 measurements with verifiable high accuracy.

Plan:
- Phase I: Laboratory testing of TDL hygrometer (~1 year, 10/1/07-9/30/08)
- Phase II: Future flight testing of a simple radiosonde system carrying TDL hygrometer

Strength:
- Expertise on sounding system development and TDL technology
- Advanced humidity calibration facility
- Great collaborations with Southwest Sciences, Inc.
- 1854 nm VCSEL (dual vertical cavity surface emitting lasers)
- 1s sampling and 5% (0.5 ppmv) accuracy from 0-30 km
- <1kg weight
- Calibrated against reference frost point

Paige (2005, JTECH)

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