

## **AVOCET ARCTAS Contributions**

High Resolution Measurements of Atmospheric CO<sub>2</sub> traceable to the WMO scale (archive 1 sec data; precision 0.1 ppm; accuracy  $\pm 0.25$  ppm)

Examine the large-scale distributions of a radiative tracer inextricably connected to climate change.

Investigate the influence of LRT and boreal wildfires on the Arctic atmosphere.

Provide a distinct label for air entering the UT for investigative studies of STE, convection, pyro-convection.

Offer validation of AIRS CO<sub>2</sub> column retrievals; benefit OCO retrieval algorithm development, temperature retrievals from space-borne sensors (TES, MLS, AIRS) and meteorological forecasts.

### ***Intrinsic merit for carbon cycle studies:***

Observations over a region where the amplitude of the seasonal cycle is 15 – 20 ppm.

Help constrain regional carbon fluxes by providing information in the vertical.

Quantify the distribution of fossil fuel derived CO<sub>2</sub> in a sub-set of ARCTAS observations.

Examine the linkage between the distribution of CO<sub>2</sub> concentrations and the underlying terrestrial landscape through remotely sensed data products (e.g. MODIS, MISR).

## **AVOCET Operational Requirements, Other**

- Avoid cold soaking the instrument
- Avoid rapid changes in cabin temperature and cabin altitude
- Sufficient reference gas for suitcase flights – 4 to 5 flights per cylinder.
- Coordination with other CO<sub>2</sub> measurement efforts e.g. Summit, Greenland; NOAA ESRL Barrow Baseline Observatory and Poker Flats airborne measurements; UAF tower, others.