Flight Report
Transit from Punta Arenas to Santiago; November 23, 2009

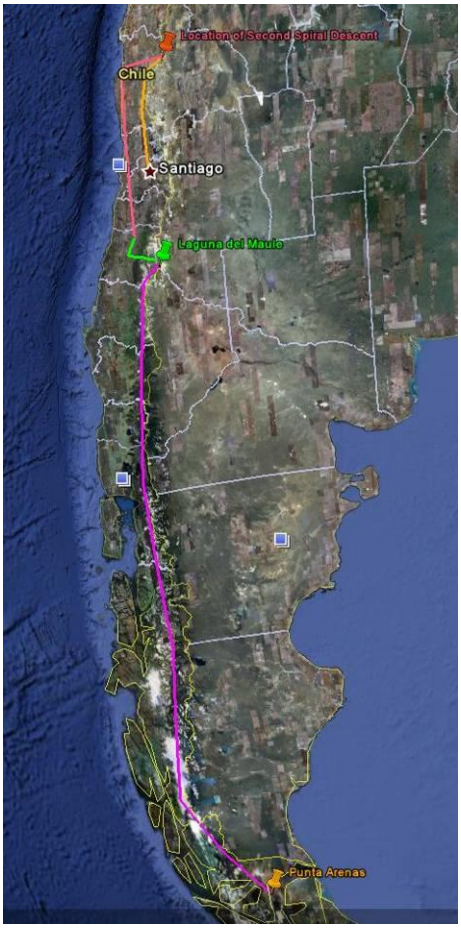
Objectives:
1. Collect validation data for AIRS CO2 channel, including high altitude legs and spiral vertical profiles from high altitude to surface.
2. Collect local data from vicinity of Punta Arenas, both city center and industrial facility.

Instruments:
AVOCET/Stephanie Vay: CO2 measurements; preliminary data in hand
DACOM/Glenn Diskin: CO, CH4, and N2O; preliminary data in hand
DLH/Glenn Diskin: H2O vapor; preliminary data in hand
WAS/Don Blake: Whole Air Sampler; awaiting return of samples to lab at Irvine

On the aircraft: Jim Plant, Glen Sachse, Melissa Yang

Summary:
The flight began with two low-level passes by the city of Punta Arenas and a large industrial complex to the north. Both passes were done over the Strait of Magellan, downwind of the city. Preliminary data indicate a less polluted boundary layer than we experienced during the other local sampling leg (OIB flight of 10/28). The relatively early Monday morning departure following a weekend may have contributed to this difference; a detailed analysis of the data from both flights is expected to help resolve this.

After sampling the Punta Arenas area, the aircraft climbed to about 35,000 ft, near the local tropopause and near the peak of the AIRS CO2 sensitivity. The route north kept close to the Chile-Argentina border. The first spiral descent took place over the over Laguna del Maule, a high mountain lake right on the border. The center of the spiral was located at approximately 36° 4' 3.5" S, 70° 29' 33.5" W. Following the spiral, the flight track took the route of a river valley that goes all the way to the Central Valley near the town of Talca The aircraft then turned to the NNE for a short low-altitude pass over this agricultural region, and then climbed to continue the track north. During the spiral, river valley, and Central Valley portions, a lot of structure was observed in all of the in-situ measurements, as well as enhancements in the concentrations.



The track north continued past Santiago, drifting toward the coast before finally turning east to reach the second spiral location, again on the Chile-Argentina border at 30° 9' 28.20" S, 69° 55' 16.83" W. Both a descending and an ascending profile were done at that location, positioning the aircraft for the short leg back to Santiago. The profiles during the second set of spirals showed less structure and smaller enhancements than had the earlier profile.

Overall assessment:
Preliminary indications are that this flight was very successful. All instruments operated normally and the data quality appears to be excellent. We look forward to analyzing the full data set once the WAS samples have been characterized. We appreciate having the opportunity to design this transit flight to help meet the needs of the AIRS CO2 instrument.