AVIRIS Inflight Calibration Experiment 2000 and Preliminary Results from Argentina

Robert O. Green and Betina Pavri

Jet Propulsion Laboratory / California Institute of Technology

Overview

- Objective / Justification
- Approach
- Inflight Calibration Experiment
  - Leoncito 010122
  - Rogers Dry Lake 010606
- Summary

Justification / Objective

•Each year AVIRIS is calibrated in a laboratory.

•The laboratory environment that is vastly different from the Q-Bay of the ER-2

•AVIRIS calibration only matter for airborne science and application data sets

•To validate the calibration of AVIRIS inflight an Inflight Calibration Experiment has been developed

•The Inflight Calibration Experiment compares AVIRIS measured radiance with predicted radiance for a surface calibration target

Inflight Calibration Experiment Implementation

•Measure the surface and atmosphere at the time of AVIRIS overflight

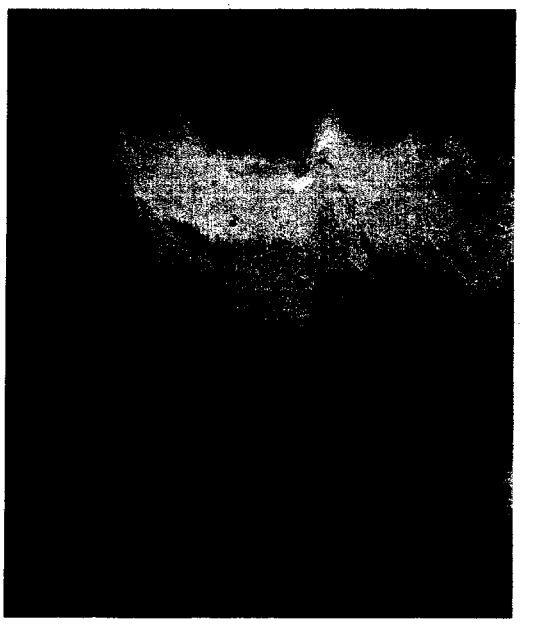
•Use surface and atmosphere measurement to constrain a radiative transfer code to predict the radiance at AVIRIS

•Compare and analyze the AVIRIS measured and RTC predicted radiance

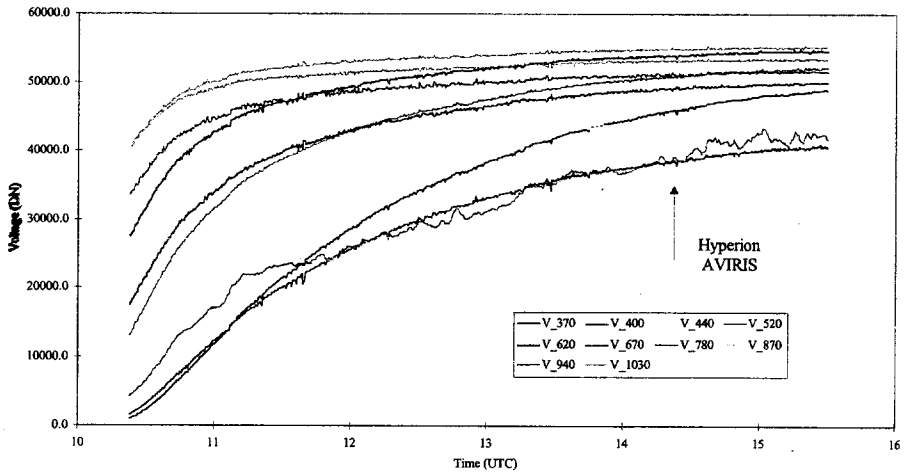
•Report the inflight calibration results

AVIRIS Image Leoncito, Arg 010122

AVIRIS Image Leoncito, Arg 010122

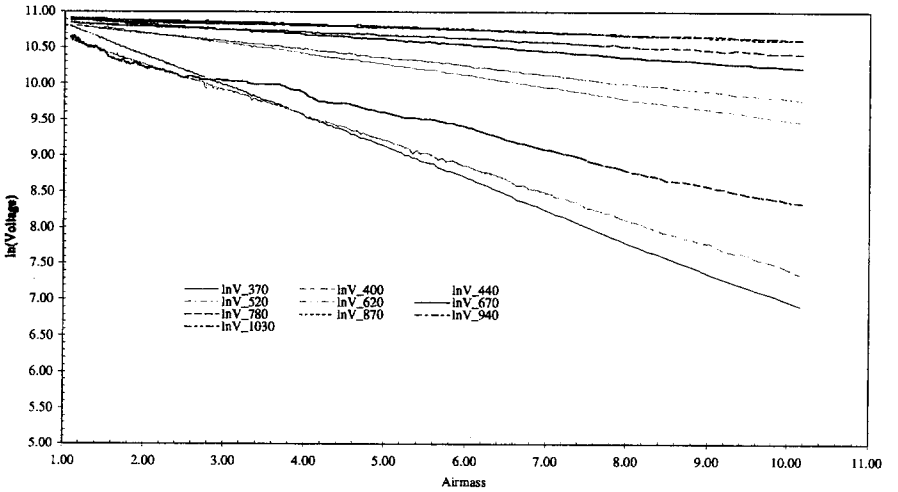


Optical Depth Measurements
Leoncito, Argentina, 010122

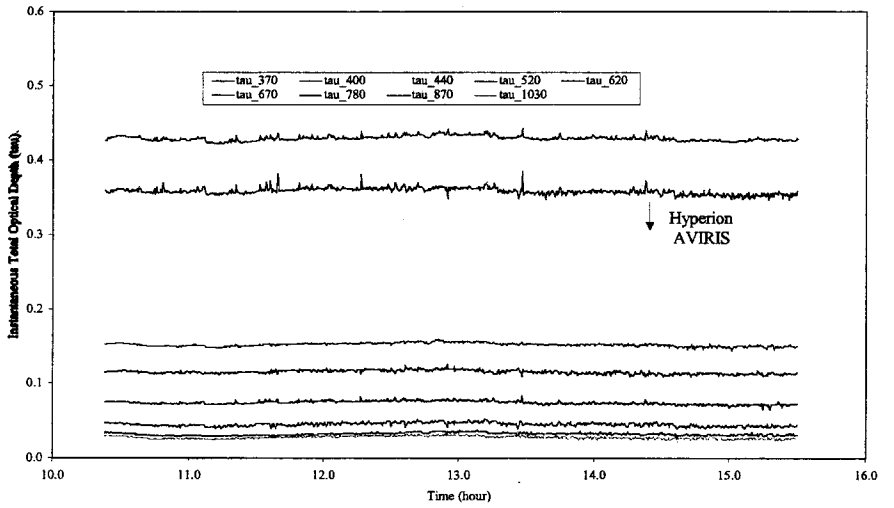


Optical Depth Measurements
Leoncito, Argentina, 010122

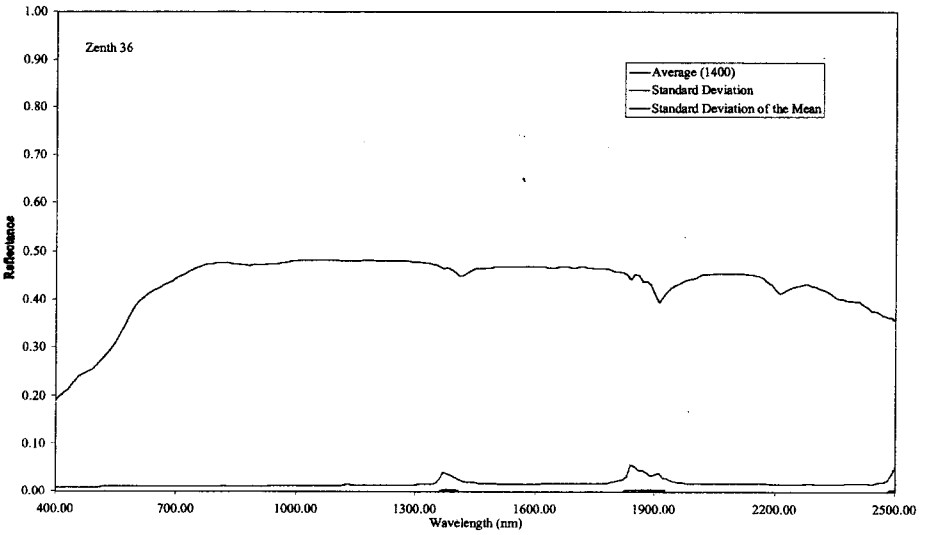
2



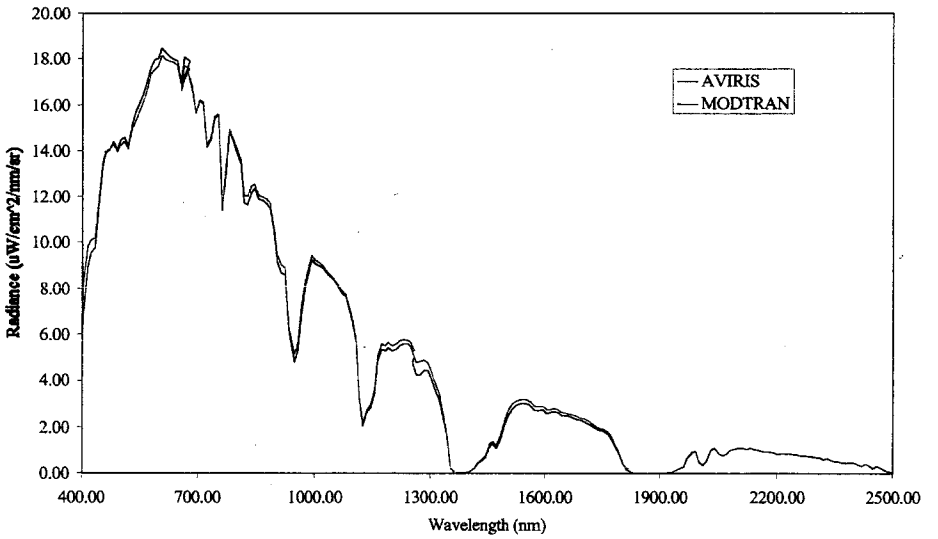
Optical Depth Measurements
Leoncito, Argentina, 010122



Calibration Target
Leoncito, Argentina 010122, 2000m

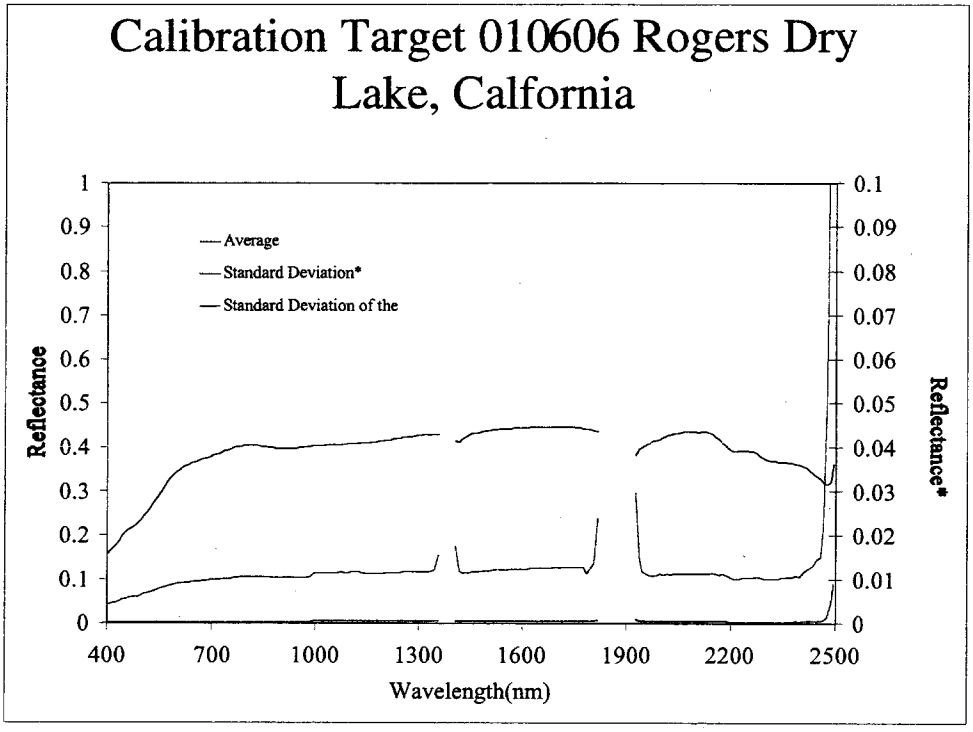


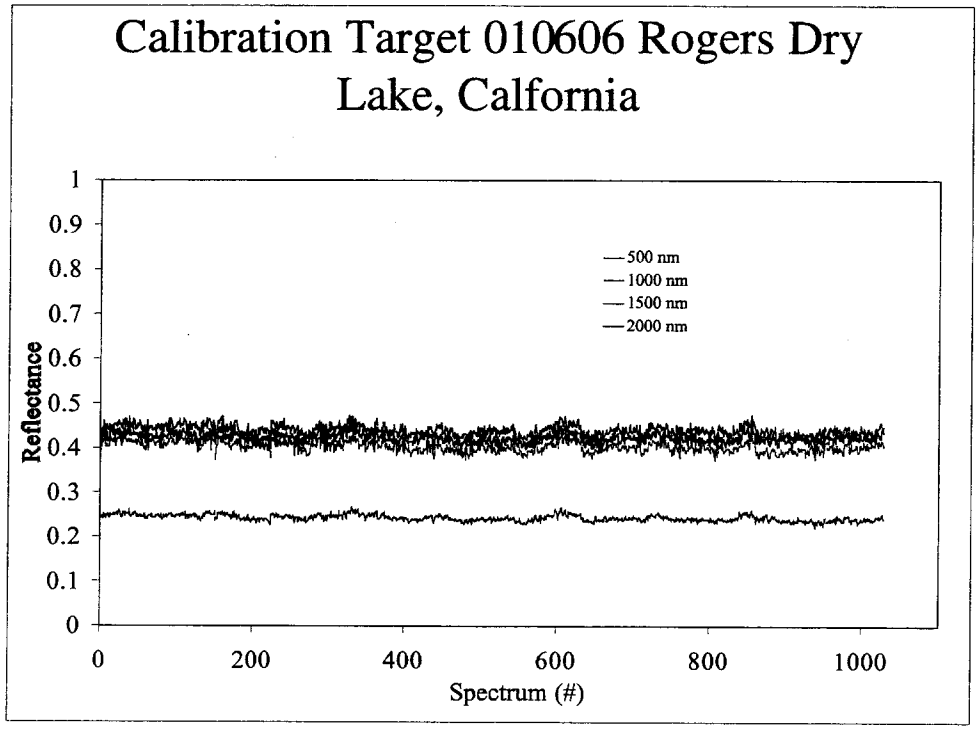
PreliminaryCalibration Experiment Results Leoncito, Argentina, 010122, 2000m



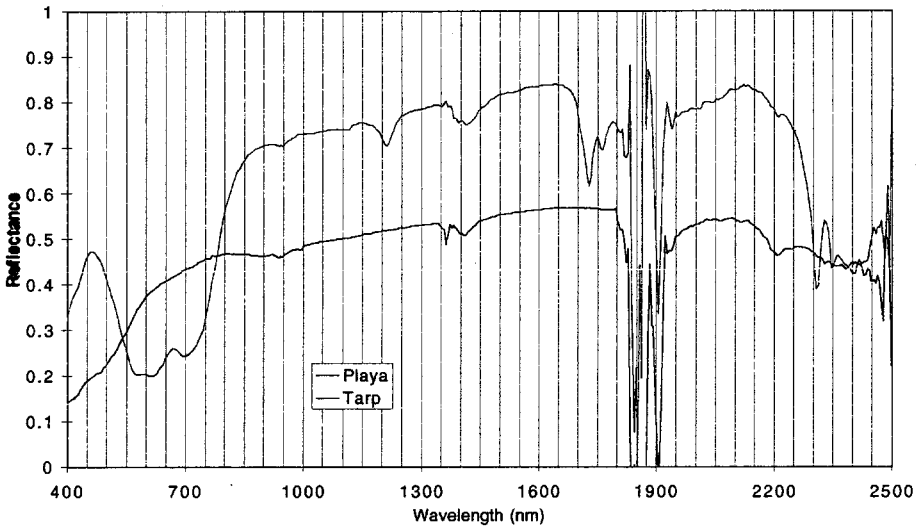
Inflight Calibration Experiment

- Rogers Dry Lake, CA
- 010606


Calibration Target 010606 Rogers Dry Lake, Calfornia
Average
Standard Deviation*
Standard Deviation of the
Reflectance
Reflectance*
Wavelength(nm)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
400
700
1000
1300
1600
1900
2200
2500

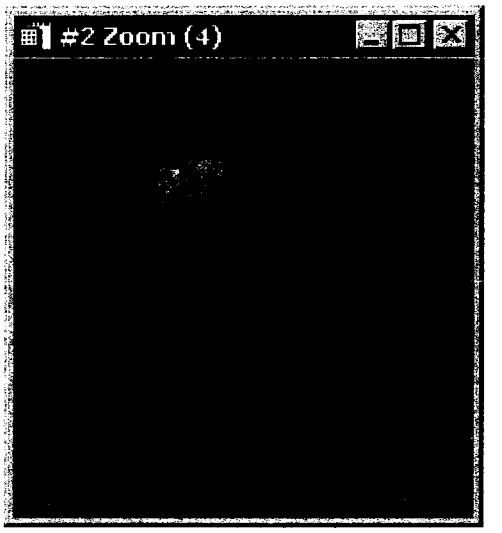

Calibration Target 010606 Rogers Dry Lake, Calfornia
500 nm
1000 nm
1500 nm
2000 nm
Reflectance
Spectrum (#)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
200
400
600
800
1000

Demarcation Tarp Spectrum

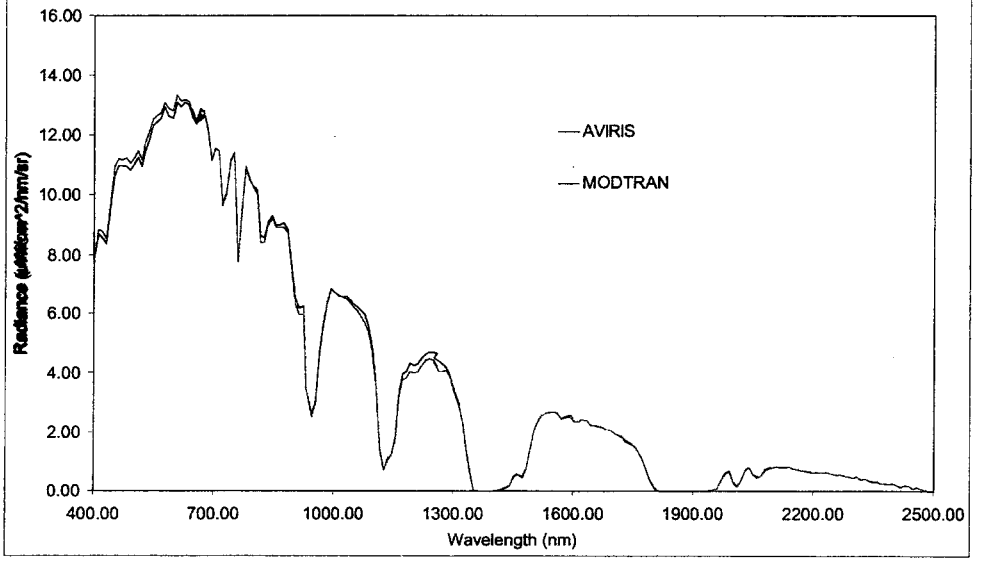


010606 Rogers Dry Lake, Calfornia

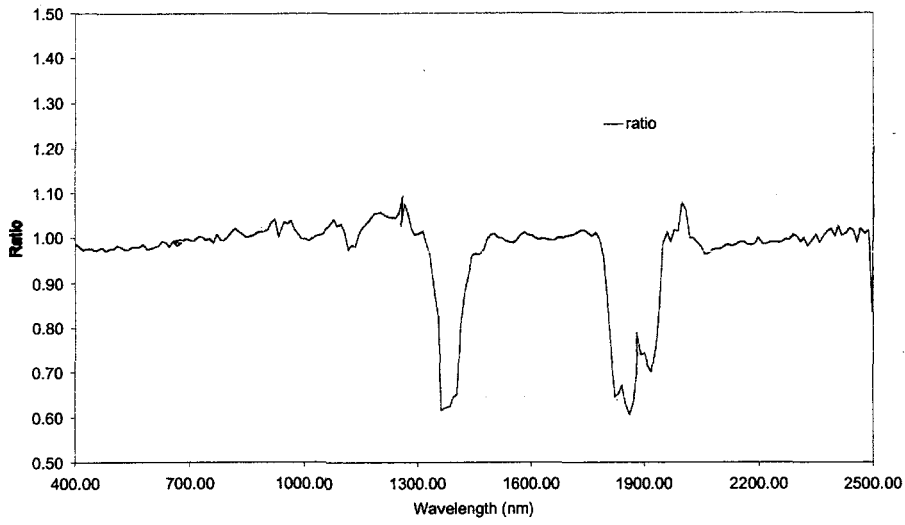
Calibration Target 010606 Rogers Dry Lake, California



Calibration Experiment 010606 Rogers Dry Lake, Calfornia



Calibration Experiment
010606 Rogers Dry Lake, Calfornia



Summary

•Results from two Inflight Calibration Experiments in 2001 have been reported

•AVIRIS has been shown to be well calibrated, showing 96% agreement between predicted and measured radaince

•Aspects of the spatial properties of AVIRIS have been presented

•In 2002 AVIRIS measurements will change
- The swath will grow to 680 cross track elements
- Georectification will be routinely available
- Onboard calibration will be improved