

## **REFLECTANCE-BASED APPROACH**

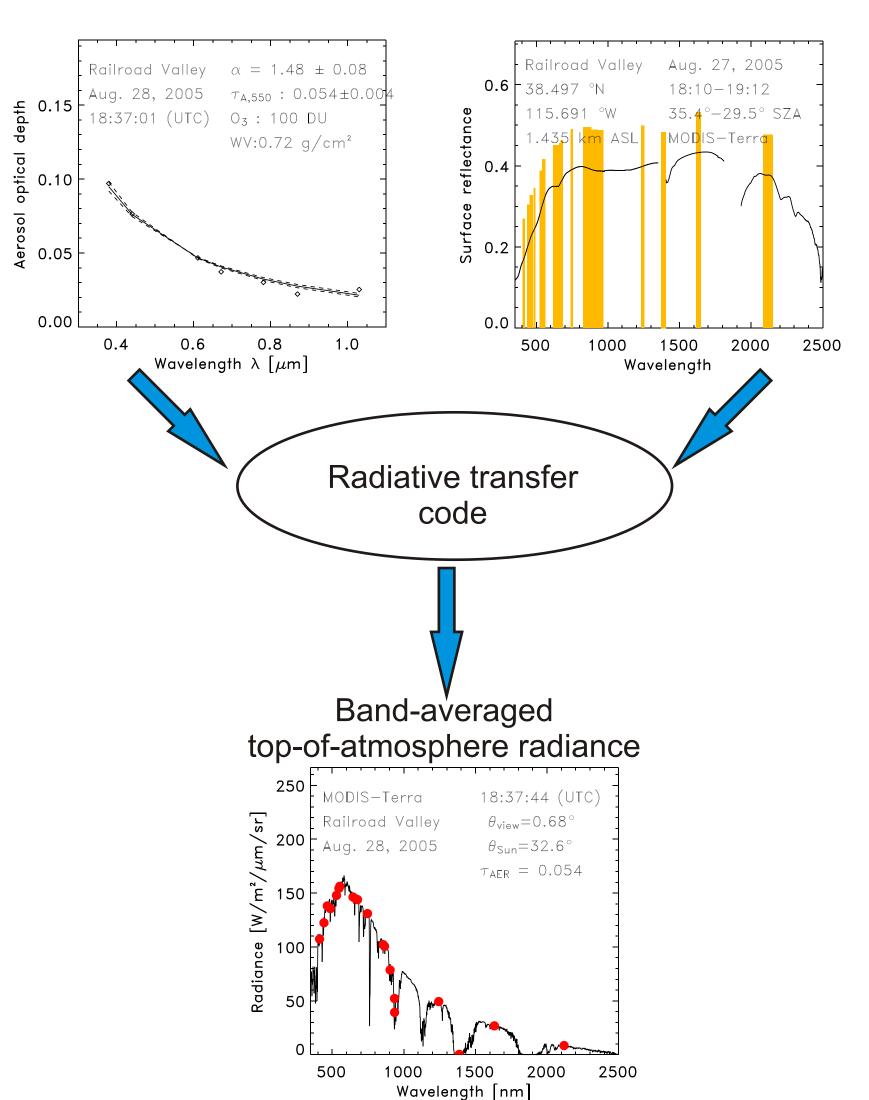


Atmospheric measurements

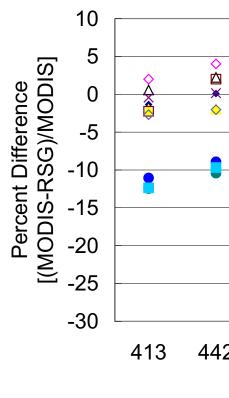


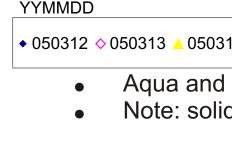
Surface reflectance measurements

- During sensor overpass, RSG personnel measure atmospheric and surface reflectance parameters
- Results from each are used as input to a radiative transfer code
- Output is band-averaged radiance, which is compared to the sensor under test



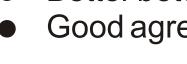
## Aqua and Terra MODIS Data: Mar-Sep 2005

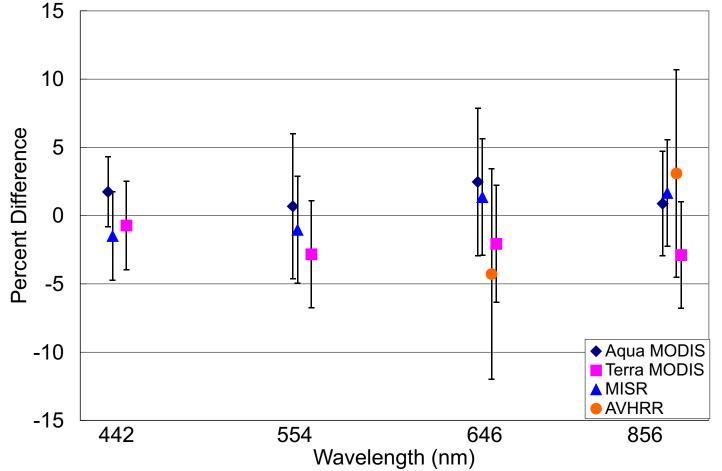




# COMPARISON WITH OTHER SENSORS

- are the same
- MODIS, MISR, and AVHRR ground data are all collected using the same site at Railroad Valley
- Agreement is within uncertainties of the method





# VICARIOUS CALIBRATION OF AQUA AND TERRA MODIS

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## CURRENT WORK

• The reflectance-based approach is continuing to be used successfully at Railroad Valley Playa, Nevada

• Ten new data sets have been processed for MODIS (5 Aqua and 5 Terra) during the time frame of March-September 2005

• We have begun to include AVHRR data to compare MODIS and AVHRR vegetation products Calibrating MISR is a logical step since MISR and MODIS view the same site simultaneously

# 1242 1629 2114 Wavelength (nm)

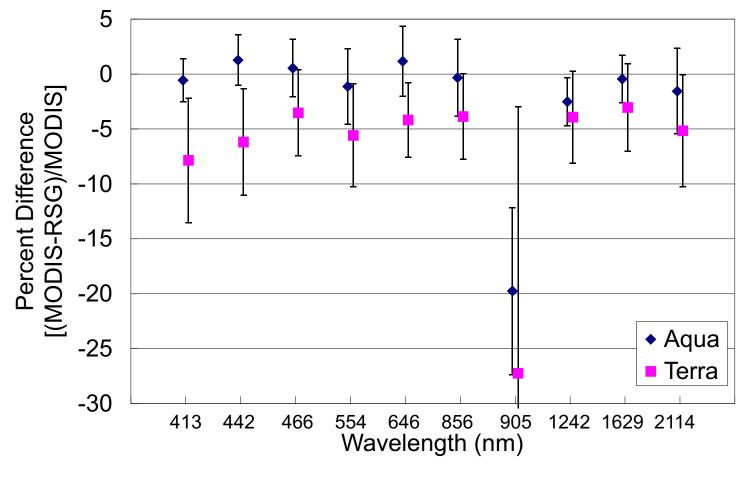
### • 050312 ◊ 050313 ▲ 050314 △ 050315 × 050416 □ 050619 ● 050709 ● 050718 ■ 050828 ◊ 050923

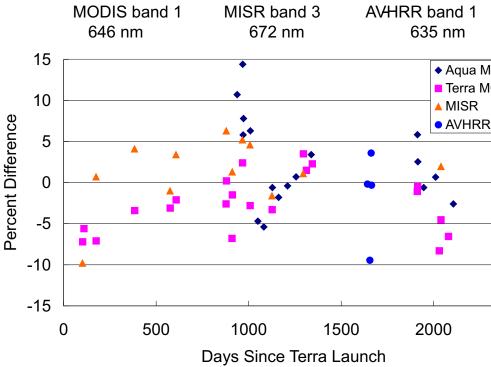
Note: solid points are Terra, hollow points are Aqua

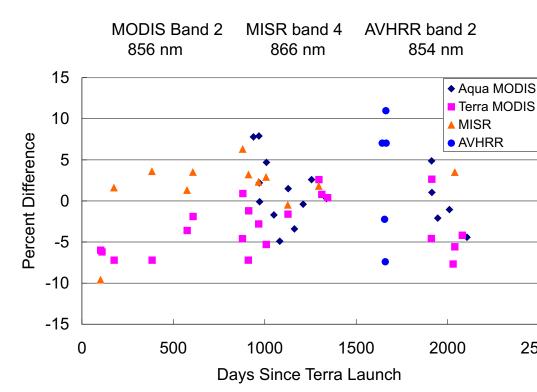
• MODIS and MISR provide an excellent opportunity for cross calibration since observation and atmospheric conditions

• Better between MISR and Aqua MODIS in general Good agreement with AVHRR (only 5 dates)

### MODIS RESULTS BY SPECTRAL BAND MODIS Band 8 (413 nm MODIS Band 9 (442 nm) 🔺 Aqua 💻 Terra 🔺 Aqua 🗖 Terra Average: Aqua and Terra MODIS (Mar-Sep 2005) MODIS Band 4 (554 nm) IODIS Band 1 (646 nm) 🔺 Aqua 🗖 Terra 🔺 Aqua 🏼 Terr Davs Since Terra Launc MODIS Band 2 (856 nm MODIS band 17 (905 nm) 🔺 Aqua 🗖 Terra Aqua -25 Terra **A A** 554 646 856 905 1242 1629 2114 Percent MODIS-F 442 466 413 Wavelength (nm) A A Average values from 10 days of data Includes both Aqua and Terra MODIS Days Since Terra Launch Days Since Terra Launch MODIS Band 5 (1242 nm) MODIS band 6 (1629 nm) 🔺 Aqua 🔳 Terra 🔺 Aqua 💻 Terra AV/HRR band 1 MISR band 3 MODIS band 1 646 nm 672 nm 635 nm Aqua MODIS Terra MODIS ercen . . MISR AVHRR Days Since Terra Launch Days Since Terra Launch MODIS Band 7 (2114 nm) 🔺 Aqua 💻 Terra **A A** 2000 500 1500 2500 Days Since Terra Launch









# CONCLUSIONS

Days Since Terra Launch

- Results for near-nadir view angles are typical of what RSG has observed in previous measurements
- Results from Aqua and Terra MODIS have a higher percent difference from predicted values when view angles are larger
- Average differences are +4% to -3%, which is within the method uncertainty, but statistically significant in some cases

2500

Aqua and Terra MODIS data from Mar-Sep 2005