Atmospheric Correction Discussion

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Reminder

Ultimate goal of atmospheric correction discussion is understanding the impact of uncertainties in the correction

- Concentrated on impacts to vicarious calibration
- Develop a set of recommended approaches to ensure better comparability between different groups
  - Permit development of new methods
  - Create a common starting point for all groups
- Areas for best practices are
  - Radiative transfer code
  - Input parameterization
  - Measurement approaches
  - Instrumentation
  - Retrieval methods

Step 1 – Radiative transfer code standard data set

Base input data set uses a clean aerosol over a moderately bright surface

- No aerosol absorption highlights impact of aerosol composition selection
- Modest aerosol loading (0.2 at 550 nm)
- Spectral reflectance constant with wavelength
  - Base case input of 0.4 reflectance
  - Second case with 0.05 reflectance
- 45 degree view angle (no ambiguity on elevation versus zenith)
- 60-degree solar zenith angle (large difference in radiance if elevation versus zenith angle confusion)
- Lambertian surface
- TOA reflectance output at 1-nm intervals from 400 to 2500 nm

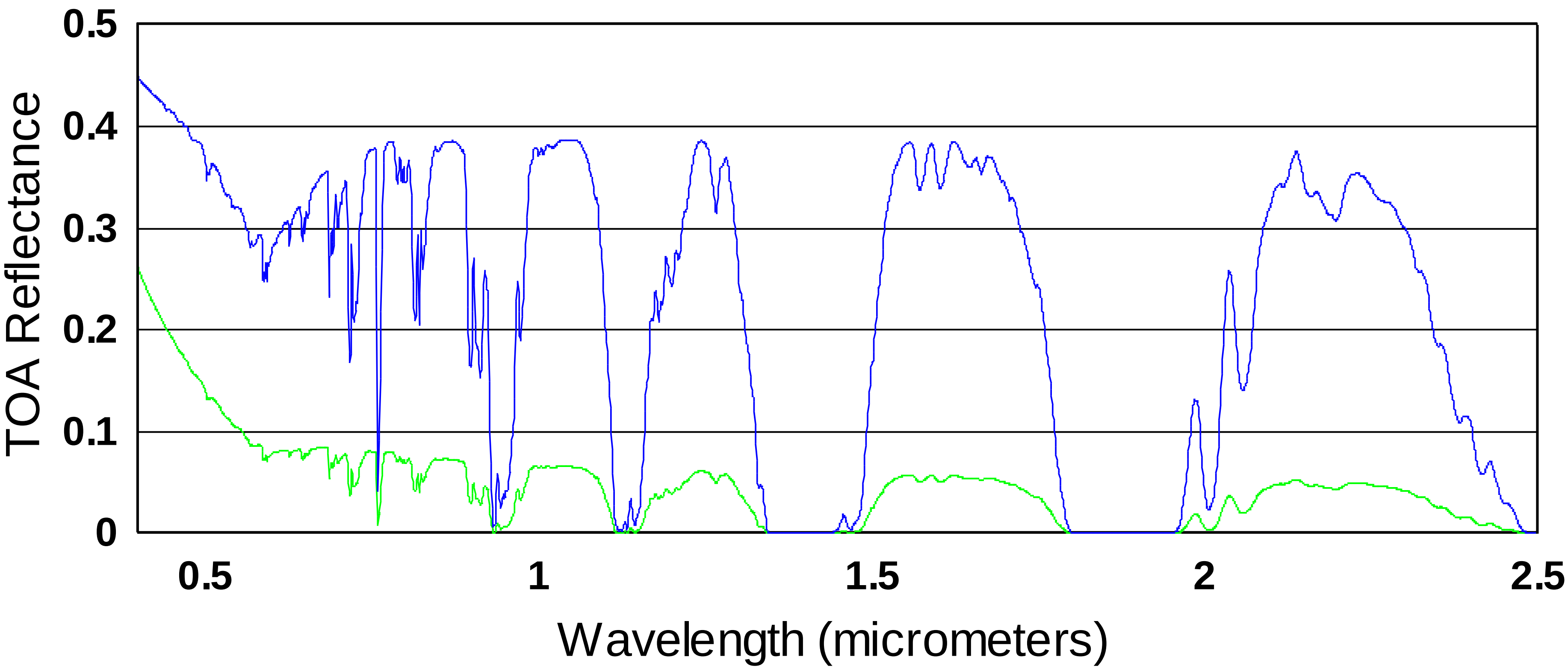
Atmospheric parameterization

List of parameters that will be reported include consistently derived multiple formats

- Spectral optical depth (total, component)
- Aerosol optical depth at 550 nm = 0.20
- Angstrom coefficient (also known as power law exponent) = 1.00
- Junge parameter = 3.00
- Surface pressure = 1013 mb
- Column water vapor amount = 2.54 cm
- Column ozone amount = 280 Dobsons
- Clean Maritime aerosol type
  - Real index – 1.39
  - Imaginary index – 0.0
- View-sun geometry
  - View zenith – 45 degrees
  - Solar zenith – 60 degrees
  - Delta azimuth – 90 degrees
- Surface height – 0 km
- Sensor height - >100 km

Sample outputs

Two base cases have been run and further cases are being developed



Summary

Data set generation has taken place and we are using RadCalNet work to develop multiple output sets

- Attempting to pre-determine likely questions
- Work is being combined with RadCalNet efforts
  - Document radiative transfer code uncertainties
  - Help develop answers to questions from newer users
- Will generate a sensitivity analysis example
  - Helps with RadCalNet uncertainty development
  - Provide guidance to newer users
- Further outcomes
  - Compiling results leads to a set of best practices
  - Processing schemes
  - Input parameterization
  - Recommended measurement approaches

Coupling with Atmospheric Correction Task Group

WGCV is implementing an Atmospheric Correction Task Group

- More on task groups in later IVOS talk
- Recall the IVOS atmospheric correction activity is primarily interested in impact of atmospheric correction in vicarious calibration
  - Use of radiative transfer codes
  - Measurement approaches to assess atmospheric parameters
- Atmospheric Correction Task is evaluating impacts of atmospheric correction on user products
  - Cross cutting the Land Product Validation, Atmospheric, and IVOS sub groups
  - Interaction with other CEOS non-CEOS entities
- Lessons learned from the Task Group will feed back into the IVOS activity (and vice versa)

Terra will turn 16 years old in December

Terra has ben instrumental in helping us understand calibration methods