Aerosol absorption retrievals from base-line OCI observations

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The overarching objective of the proposed work is to:

*Develop algorithms that identify and quantify aerosol absorption using the base-line configuration of OCI.*

As a byproduct:

*Explore opportunity to retrieve aerosol AOD and quantify aerosol absorption over ocean and land*

Retrieve absorption when aerosol loading is high,

Identify absorption when aerosol loading is low
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Old MODIS algorithm

INPUT: 6 OCI wavelengths (0.55 µm to 2.1 µm)

Apply standard MODIS Dark Target ocean aerosol retrieval

OUTPUT: AOT at 0.55 µm, choice of fine and coarse non-absorbing model and fine mode fraction

New OCI addition

INPUT: AOT at 0.55, choice of non-absorbing model plus 2 OCI wavelengths in the UV (0.354 µm and 0.388 µm)

Match measured UV reflectances to LUT consisting of four new models: Non-absorbing (NA), Dust (Du), Combustion-1 (C1) and Combustion-2 (C2)

OUTPUT: Choice of one of the 4 types of absorbing aerosol models
The key is to fit to different *spectral* absorption models.
Apply to collocated OMI and MODIS imagery
Retrieved absorption model

AOD

FMF

NA  Du  C1  C2

0.00 0.30 0.60 0.90 1.20 1.50

0.20 0.36 0.52 0.68 0.84 1.00
Summary of 1\textsuperscript{st} year work

1. Focused on retrievals when AOT is high
2. Have working and fully functional algorithm in place
3. With preliminary LUT
4. Tested with sensitivity studies
5. Accessed OMI-MODIS merged imagery for testing
6. Also gained experience in porting MODIS Dark Target algorithm to new sensor (VIIRS) Levy et al. (2015)

Second year focus

1. Revisit LUT
2. Address the situation when AOT is low