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Geostationary Deep Blue AOD and Multi Sensor L2G/L3 Product

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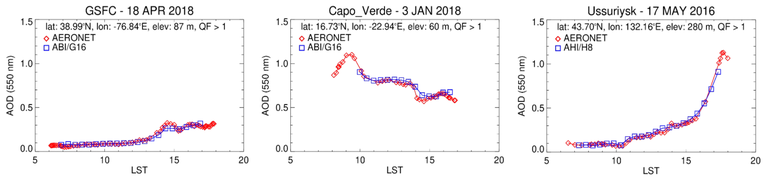
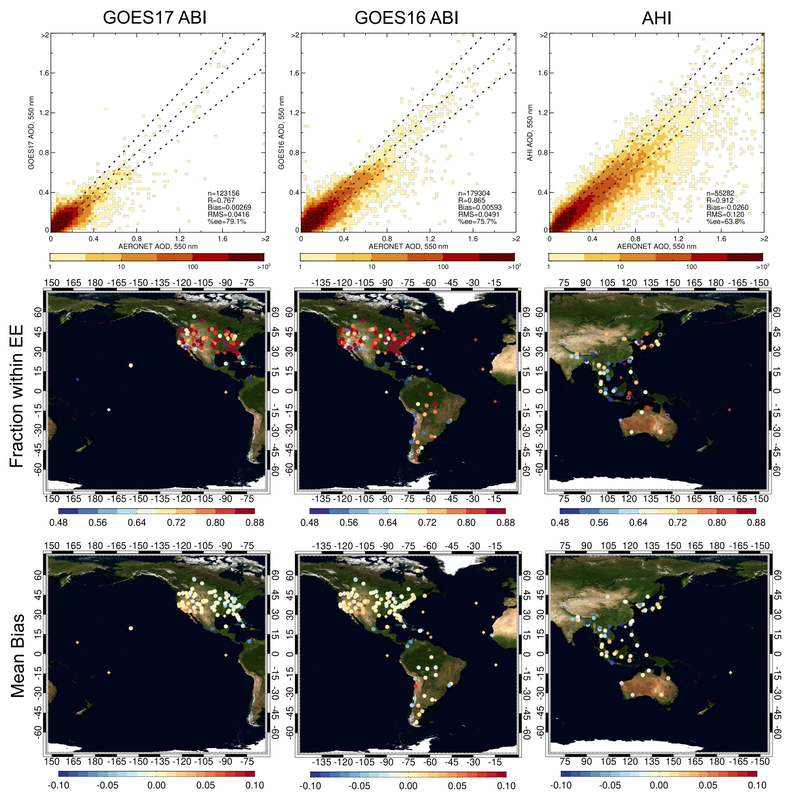
Geostationary Deep Blue Products

- NASA's Deep Blue aerosol project has provided long-term aerosol data records from low earth orbit (LEO) satellite sensors, such as AVHRR, SeaWiFS, MODIS, and VIIRS, using consistent algorithm suite (Deep Blue over land and Satellite Ocean Aerosol Retrieval or SOAR over water).
- The latest VIIRS Version 2 Deep Blue/SOAR algorithms have been adapted to measurements made by new generation geostationary (GEO) sensors, i.e., ABI aboard GOES-16/17 and AHI aboard Himawari-8.
- This presentation introduces initial aerosol products from the GEO sensors and multi-sensor (including both LEO and GEO sensors) merged products.

GEO DB Diurnal Cycle



GEO DB Validation

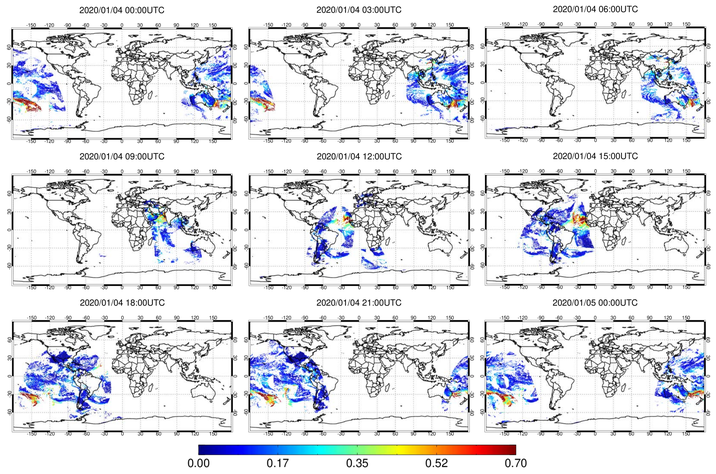


* Estimated error (EE) = ±(0.03+15%) over land, ±(0.03+10%) over ocean

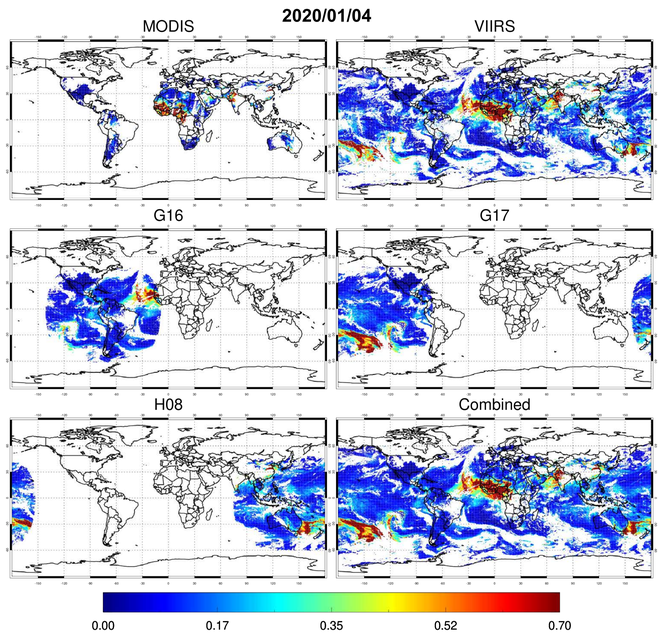
Deep Blue Multi Sensor L2G/L3

- L2 products acquired from LEO (Terra MODIS, Aqua MODIS , SNPP VIIRS, and NOAA20 VIIRS) and GEO (G16 ABI, G17 ABI, and H08 AHI) sensors have been converted to 30 min interval gridded L2 (L2G) and daily L3 products using Yori griding program developed by A-SIPS
- L2G/L3 products from individual sensors are merged in a single dataset (combined L2G/L3)
- 0.25° x 0.25° spatial resolution

Diurnal Variation of Combined L2G AOD map

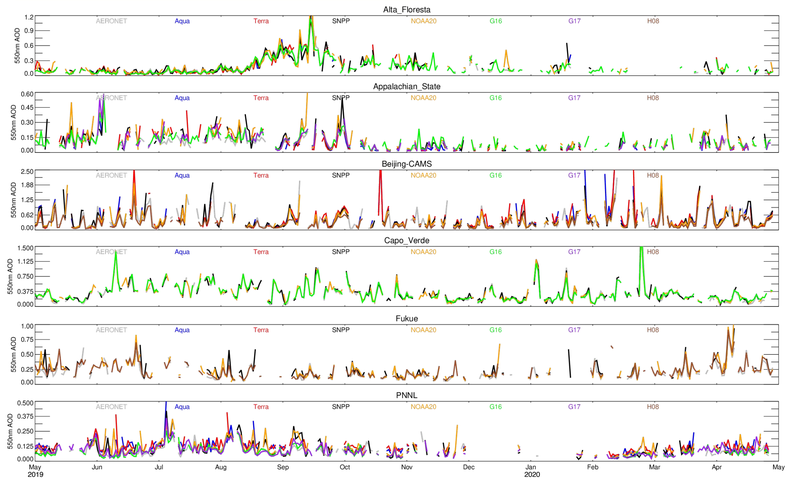


Daily L3 AOD map



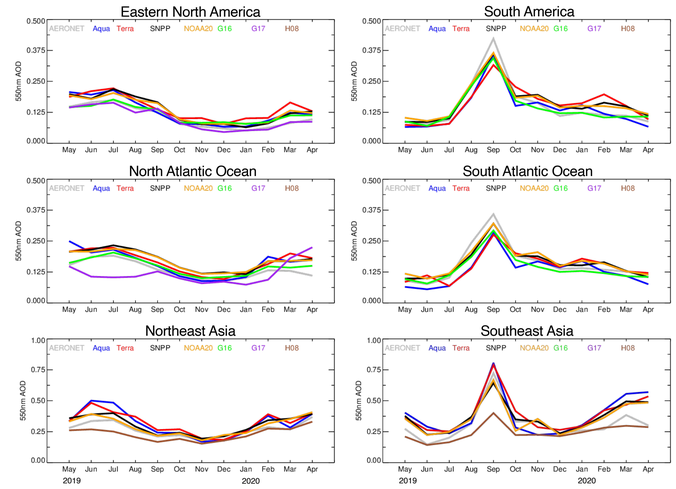
L3 timeseries

Daily L3 AOD Over AERONET Sites



- Average of 3x3 pixels of daily L3 products centered at AERONET sites

Monthly L3 AOD Regional Timeseries



- Average of AERONET-collocated monthly L3 data set within each region

Conclusion

- The Deep Blue algorithm suite has been applied to the GEO sensors, resulting in significantly improved observations of aerosol diurnal cycles from space when compared to the LEO sensors.
- Analyses of L2/L2G/L3 data indicate that the DB GEO product is in good agreement with AERONET observations.
- Through the synergy of LEO and GEO measurements, DB has demonstrated the ability to achieve wider spatial and temporal coverage than individual sensors can provide.
- The latest DB algorithm has not yet been applied to MODIS, which resulted in relatively poor agreement with AERONET compared to other data sets. In support of the Collection 7 reprocessing, the MODIS product will be updated to be consistent with other Deep Blue products.