

MIRA

Models, In situ, and Remote sensing of Aerosols



A community of collaboration, consistency, and openness

Quasi-quarterly Newsletter Number 7

Greg Schuster

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Archives available [here](#)

Welcome

We welcome Dr. Jens Redemann (University of Oklahoma) to the MIRA Steering Committee. Dr. Redemann is a long-time expert at suborbital measurements with a knack at contextualizing the measurements for model applications — a great fit for MIRA. Welcome Jens!

About MIRA

MIRA is an unfunded working group that seeks to advance knowledge of observations and model results through the encouragement of collaborations. Links to the current MIRA topics can be found here:

- [Mapping Aerosol Lidar Ratios for CALIPSO \(MAC\)](#)
- [Satellite-Assisted Particulate Matter \(SAPM\)](#)
- [Tables of Aerosol Optics \(TAO\)](#)
- [Tables of Cloud Optics \(TaCO\) *New!*](#)
- [Harmonization of aerosol Assimilation Models and Retrievals \(HAMR\)](#)



TOPIC UPDATES

MAC: Mapping Aerosol lidar ratios for CALIPSO

The MAC topic group has completed constrained lidar ratio retrievals and extinction profiles over water for the entire globe using MODIS Dark Target and MAIAC aerosol optical depths (years 2006-2018) as well as ODCOD ([Ocean Derived Column Optical Depth](#); years 2006-2021). We have preliminary annual climatological lidar ratio maps for marine, pollution/smoke, and dust aerosols. Look for Travis Toth to present an update at the International Lidar Radar Conference (ILRC) in Landshut, Germany, June 23-28, 2024.

SAPM: Satellite Assisted Particulate Matter

The SAPM group discusses various techniques for retrieving surface PM_{2.5} by merging satellite remote

sensing, global modeling, and in situ measurements. These comprehensive PM_{2.5} estimates are useful for current and future efforts in air quality research, modeling, forecasting, and other applications. Some of the current work involves retrieving PM_{2.5} concentrations over the continental US and India using data from CALIOP and CATS.

SAPM Data request: We seek the expertise of scientists from around the globe who analyze *in situ* measurements relevant to PM_{2.5}, including mass scattering coefficients, mass absorption coefficients, aerosol hygroscopic properties, routine ground-based PM_{2.5}, etc. Please contact Travis Toth (travis.d.toth@nasa.gov) if you are interested in joining our group and/or if you have access to PM_{2.5} datasets that could be of interest to SAPM.

TAO: Table of Aerosol Optics

There are now several groups who are working on single-scatter computations for distributions of different irregular shapes, including mineral dust and aggregate black carbon. We are setting up a relational database on GitHub for uploading and accessing these tables, but we also plan to make TAO available at an Earth Science data center in the coming months. Presently, we have uploaded optics computations (to GitHub) for several spherical internal mixtures of BC and BrC that grow with relative humidity (We are using 207 wavelengths from 0.25 to 40 μm and 36 relative humidities). Come see our oral and poster presentations at EGU on Wednesday, April 17 (Schuster et al and Derimian et al).

The TAO database on GitHub is currently private, but we plan to make it publicly available later this year. In the meantime, we seek alpha-testers for the TAO data on GitHub. This is a good way for users to obtain an early look at the data, and it benefits the core development group by getting more “eyes on the data.” Contact gregory.l.schuster@nasa.gov and yevgeny.derimian@univ-lille.fr to obtain access (GitHub account required).

TaCO

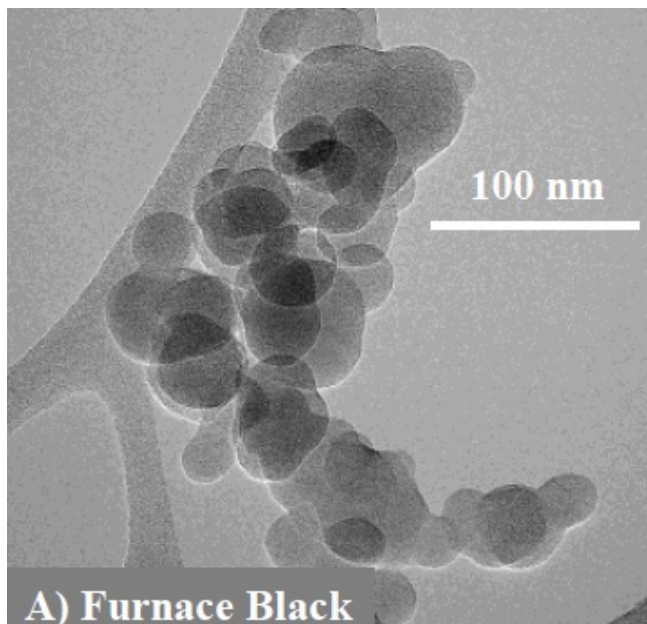
New!

(Tables of Cloud Optics)

MIRA is proud to announce this important new topic, which focuses on the single-scattering properties of liquid and ice cloud particles. Led by Dr. Masanori Saito (formerly at Texas A&M University but now at University of Wyoming), who has extensive experience with computing the optical properties of irregularly-shaped particles. Look for this new topic to appear on the MIRA webpage in the coming months.

HAMR (Harmonization of aerosol Assimilation Models and Retrievals)

Dr. Oleg Dubovik presented an update on HAMR during an oral talk in the MIRA session at AGU. If you missed it, go see him at the HAMR poster during EGU (Apr 15-19) or join us for his morphing MIRA webinar on April 22 at 13 GMT.



Singh and Vander Wal, [doi:10.3390/c5010002](https://doi.org/10.3390/c5010002).



Morphing MIRA Webinar Series

Recent Webinars There have been several MIRA webinars since our last newsletter.

In September (2023), Dr. Nick Schutgens (Vrije Universiteit Amsterdam, The Netherlands) presented: *How representative are observations? Spatio-temporal issues when using observations.*

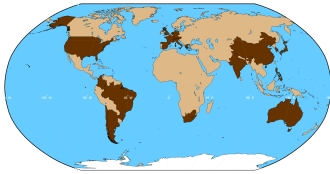
In December (2023), Dr. Willem Marais (University of Wisconsin-Madison, USA) presented: *High image resolution CALIOP aerosol extinction denoising: Constructive insights for future space-based missions.*

In January, Dr. Melita Keywood (Commonwealth Scientific and Industrial Research Organisation, or CSIRO, Australia) presented: *Long term aerosol observations at Kennaook Cape Grim and CAPE-K.*

We thank all of our speakers for great talks and for allowing us to record their presentations. Slides and recordings of all MIRA talks are available at <https://science-data.larc.nasa.gov/MIRA-WG/Morphing-MIRA-Webinar-Series/>.

The next Morphing MIRA webinar will be on Monday, April 22 at 13 GMT. Dr. Oleg Dubovik (Université de Lille, CNRS, UMR 8518 - LOA - Laboratoire d'Optique Atmosphérique, Lille, France) will present:

Harmonization of the assumptions of atmospheric aerosol properties in climate models and remote sensing approaches.



MIRA Email List

We encourage subscribers to use the MIRA list server to post newsworthy items of interest to the community, such as aerosol conferences, sessions, webinars, relevant public databases and code that are not already listed on the MIRA website. The list is moderated in the background, so direct messaging to mira@espo.nasa.gov is encouraged (no need

to request forwardings).

The MIRA email distribution list reaches 249 members in 22 countries, but we are working to expand even further. Please forward this newsletter to colleagues and encourage them to subscribe to MIRA at <https://espo.nasa.gov/lists/listinfo/mira>.



Upcoming Meetings

We have listed some meetings of relevance to MIRA that may be of interest the table below. We are still sorting out our travel schedules for next year, but we collectively plan to attend most of these meetings.

AeroCom/AeroSat

This year, AeroCom/AeroSat is hosted by Laboratoire d'Optique Atmosphérique in Lille, France, Oct 14-18, 2024. (Monitor <https://aerocom.met.no/events/aerocom2024> for announcements to come). This is particularly convenient for the TAO topical group, as several members of TAO are based at the Université de Lille. AeroCom/Aerosat is always a wonderful conference to attend, and it is especially appropriate this year if you are interested in topical discussions with TAO participants.

Opinions in this newsletter are the personal views of the author and do not represent official NASA policy.

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MIRA Homepage: <https://science.larc.nasa.gov/mira-wg/>
Archived newsletters: <https://science.larc.nasa.gov/mira-wg/info/>

Contact the MIRA Steering Committee at mira_crew@lists.nasa.gov

Conferences (hyperlinked)	Location	Date	Submit Date	MIRA people
2024 (<i>confirm with us at mira_crew@lists.nasa.gov as abstract deadlines approach</i>)				
EGU	Vienna, Austria	Apr 14-19	-	GS
<i>CALIPSO Int. Symp. on Spaceborn Lidar</i>	Saint-Malo, France	Jun 4-6	-	CT
IRS	Hangzhou, China	Jun 17-21	-	MC
AOGS	Pyeongchang, S. Korea	Jun 23-28	-	SWK, MC
ILRC	LandShut, Germany	Jun 24-28	-	VA
IGARSS	Athens, Greece	Jul 7-12	-	GS, EM, VA
Europ. Aer. Conf.	Tampere, Finland	Aug 25-30	-	BA
IGAC	Kuala Lumpur, Malaysia	Sep 9-13	Apr 30	CT?, MC, MOC?
AeroCom/AeroSat	Lille, France	Oct 14-18	Aug	OD, GS, MC, PY?
ICAP	Helsinki, Finland	Oct 25-28	-	
AAAR	Albuquerque, NM	Oct 21-25	-	Rich Moore
APOLO	Japan	Nov 18-21	May 1	GS, OD
AGU	Washington, DC	Dec 9-13	-	MIRA Session

GS: Greg Schuster; CT: Chip Trepte; MC: Mian Chin; SWK: Sang-Woo Kim; VA: Vassilis Amiridis; EM: Eleni Marinou; BA: Betsy Andrews; MOC: Maria ‘Obie’ Cambaliza, OD: Oleg Dubovik.

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