

Surface Atmosphere Radiation Budget (SARB) working group update

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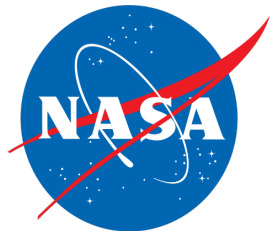
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CERES Science Team Meeting
October 17-19, 2023



Edition 4 products production and validation

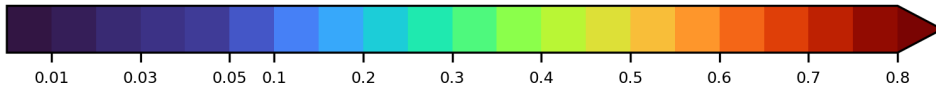
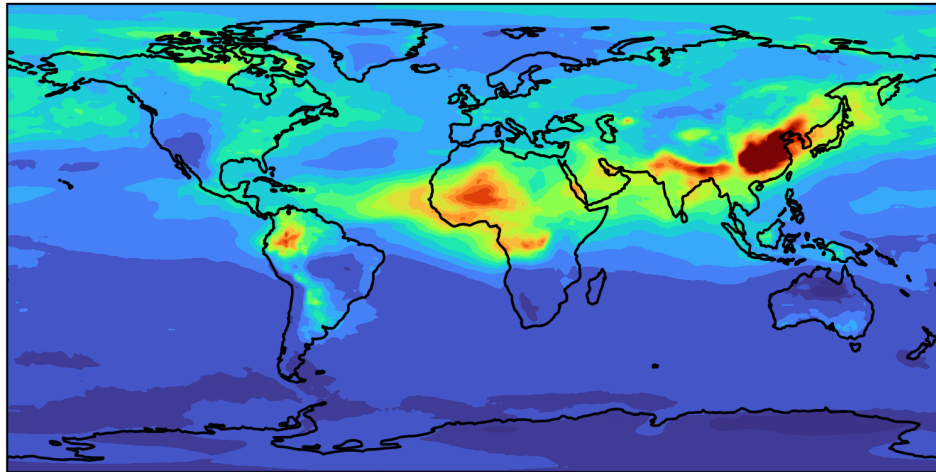
- Edition 4.2 EBAF
 - Produced and released through June 2023.
 - Edition 4.3 EBAF release in 2024 (Seiji Kato's presentation)
- Edition 4.1 SYN
 - Produced through June 2023.
- Edition 4 CRS (Seung-Hee Ham's presentation)
 - Instantaneous surface and in atmosphere irradiances (Level 2)
- Evaluation of GEOS-IT with Edition 4 CRS (David Rutan's presentation)
- Edition 4 MATCH
 - Consistency of aerosol optical thickness derived from MODIS and VIIRS
 - Working with Dark Target and Deep Blue teams to mitigate AOD differences
- CCCM D2 version
 - Processing with CALIPSO V4-51 and CloudSat R-05 data products

Edition 5 algorithm developments

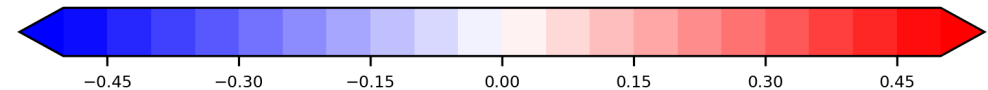
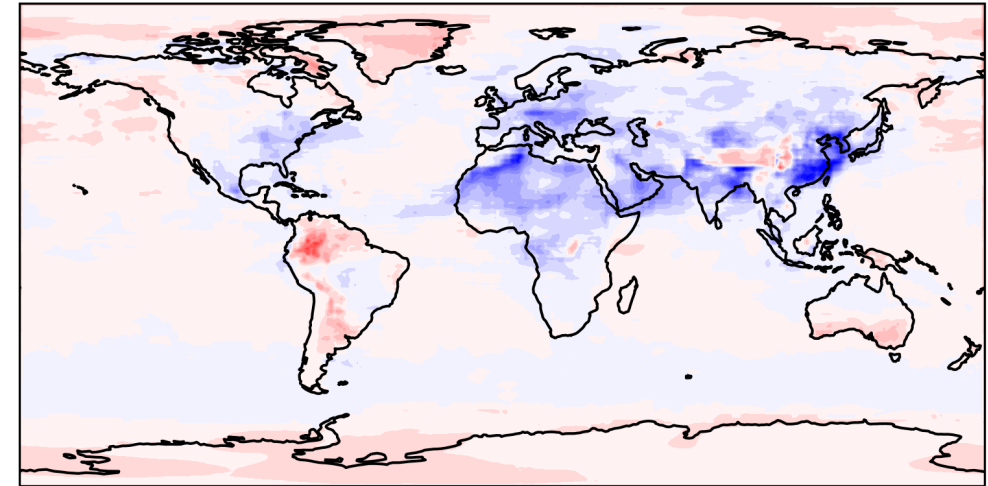
- Fu-Liou code
 - New k-distribution coefficients
 - Considering increasing number of shortwave bands
- CERES aerosol transport model (CATM)
 - Better aerosol models using CAM6
- GEOS temperature and humidity profile correction algorithm.
 - Use averaged spectral radiances (a back-up plan for CLIMCAPS), using the algorithm developed by Smith Sr. (dual-regression retrieval algorithm).

Edition 5 CATM vs. Edition 4 MATCH (June 2010)

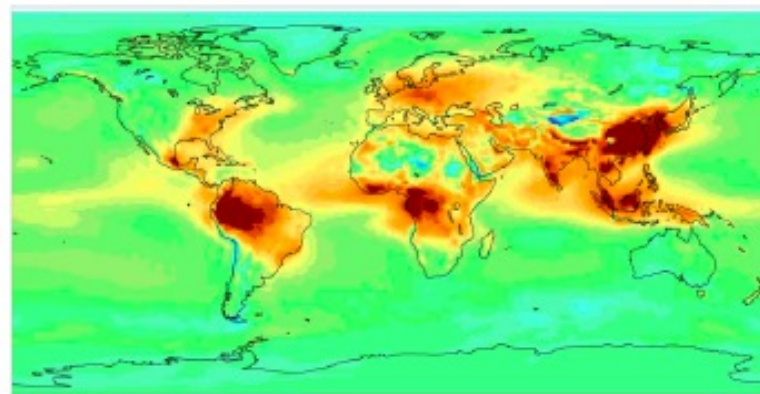
CAM MAM4 Ed5 Force AOD 550 nm Mean 0.16



CAM MAM4 Ed5 Force - MATCH Ed4 Mean 0.0017



Edition 4 MATCH – MERRA-2
(Fillmore et al. 2022)



(b) MATCH-MERRA-2 AOD (All Sky, 2000-2020)

Forced: MODIS assimilation

Publications

- Kato, S., N. G. Loeb, F. G. Rose, S.-H. Ham, T. J. Thorsen, D. A. Rutan, W. F. Miller, T. E. Caldwell, D. R. Doelling, S. Sun-Mack, 2023: Seamless continuity in CERES Energy balanced and Filled (EBAF) surface radiation budget across multiple satellites, submitted *to J. Climate*.