Surface Atmosphere Radiation Budget (SARB) working group update

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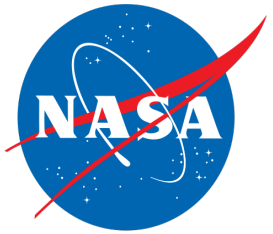

CERES Science Team Meeting
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Edition 4 products production and validation

- Edition 4.2 EBAF
  - Produced and released through December 2022.
- Edition 4.1 SYN
  - Produced through December 2022.
- Edition 4 CRS (Seung-Hee Ham's presentation)
  - Terra and Aqua separate products are available from ASDC.
  - Validation using MOSAiC and South Antarctica data.
  - Assess consistency between CRS and SYN1deg-hour.
  - TISA group develop the sub-setter
- Edition 4 MATCH
  - Evaluated clear-sky and all-sky aerosol optical thickness and documented the results (Fillmore et al. 2022)

Edition 5 algorithm developments

- Fu-Liou code
  - New k-distribution coefficients
- MATCH transport model (David Fillmore's presentation)
  - Better aerosol models using CAM6
- MOA
  - 0.5 degree by 0.5 degree equal angle grid is completed. The cloud working group is currently using.
  - Equal angle to equal area conversion code is complete and validated
- GEOS temperature and humidity profile correction algorithm.
  - A back-up plan for CLIMCAPS, using the algorithm developed by Smith Sr.

Publications

- Scott, R. C., F. G. Rose, P. W. Stackhouse Jr., N. G. Loeb, S. Kato, D. R. Doelling, D. A. Rutan, and P. C. Tayler, 2022: Clouds and the Earth's Radiant Energy System (CERES) Cloud Radiative Swath (CRS) Edition 4 data product, Journal of Atmospheric and Oceanic Technology, 39, 1781-1797, DOI: 10.1175/JTECH-D-22-0021.1.
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- Ham, S.-H., S. Kato, F. G. Rose, No G. Loeb, K.-M. Xu, T. Thorsen, M. G. Bosilovich, S. Sun-Mack, Y. Chen, and W. F. Miller, 2021: Examining cloud macrophysical changes over the Pacific for 2007-17 using CALIPSO, CloudSat, and MODIS observations, J. Appl. Meteorol., 60, 1105-1126, DOI: 10.1175/JAMC-D-20-0226.1.
- Ham, S.-H., S. Kato, F. G. Rose, S. Sun-Mack, Y. Chan, W. F. Miller, and R. C. Scott, 2022: Combining cloud properties from CALIPSO, CloudSat, and MODIS for top-of-atmosphere (TOA) shortwave broadband irradiance computations: Impact of cloud vertical profile, J. Appl. Meteorol. Clim., 61, 1449-1471, DOI: 10.1175/JAMC-D-21-0260.1.
- Huang, Y, P. C.Taylor, F. G. Rose, D. A. Rutan, M. D. Shupe, M. A. Webster, and M. M. Smith, 2022. Toward a more realistic representation of surface albedo in NASA CERES-derived surface radiative fluxes: A comparison with the MOSAiC field campaign. Elem Sci Anth, 10: 1.
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- Kato, S., T. J. Thorsen, S.-H. Ham, N. G. Loeb, R. A. Ferrare, D. M. Winker, H. Barker, G. L. Stephens, S. Schmidt, K. G. Meyer, and B. Cairns, 2022: Effect of spectral variability of aerosol optical properties on direct aerosol radiative effect, Front. Remote Sens. 3:90405 doi: 10.3389/frsen.2022.90405.