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Address for correspondence:

Dr. Charles ICHOKU
Climate and Radiation Laboratory, Code 613
NASA Goddard Space Flight Center
Greenbelt, MD 20771, U.S.A.

Phone : (1) 301-614-6212
Fax : (1) 301-614-6307 or (1) 301-614-6420
E-mail : Charles.Ichoku@nasa.gov

Abstract Title:

Preparations for robust model evaluation using integrated aerosol observations

Charles Ichoku and Maksym Petrenko

Climate and Radiation Laboratory, Code 613, NASA/GSFC, Greenbelt, MD 20771, USA.

ABSTRACT

Evaluation of important aspects of aerosol models require reliable observations acquired in situ or by ground-based or satellite remote sensing. Aerosol retrieval from satellite has practically become routine, especially during the last decade. However, there is often disagreement between similar aerosol parameters retrieved from different sensors, thereby leaving users confused as to which sensors to trust for model evaluation as well as for answering important science questions about the distribution, properties, and impacts of aerosols. As long as there is no consensus, and the inconsistencies are not well characterized and understood, there will be no way of developing reliable model inputs and climate data records from the full extent of the available satellite aerosol measurements, and models cannot be thoroughly evaluated despite the abundance of these complimentary measurements. A recently developed web-based Multi-sensor Aerosol Products Sampling System (MAPSS) that collocates aerosol measurements from multiple sensors with AERONET data, along with its companion statistical tool, AeroStat, are facilitating detailed comparative uncertainty analysis of satellite aerosol measurements from Terra-MODIS, Aqua-MODIS, Terra-MISR, Aura-OMI, Parosol-POLDER, SeaStar-SeaWiFS, and Calipso-CALIOP. This analysis has lead to a proposal for a multi-sensor aerosol data unification scheme that will pave the way for validated unified satellite data products suitable for model evaluation and other modeling activities. In this presentation, we will describe the strategy for the multi-sensor aerosol unification and show preliminary results as well as plans for model evaluation.