TECHNOLOGY

Multi-Sensor Aerosol Products Sampling System (MAPSS)

OVERVIEW

Global and local properties of atmospheric aerosols have been extensively observed and measured using both spaceborne and ground-based instruments, especially during the last decade. Unique properties retrieved by the different instruments contribute to an unprecedented availability of the most complete set of complimentary aerosol measurements ever acquired. However, some of these measurements remain underutilized, largely due to the complexities involved in analyzing them synergistically. To characterize the inconsistencies and bridge the gap that exists between the sensors, researchers at the University of Maryland have established a Multi-sensor Aerosol Products Sampling System (MAPSS), which consistently samples and generates the spatial statistics (mean, standard deviation, direction and rate of spatial variation, and spatial correlation coefficient) of aerosol products from multiple spaceborne sensors, including MODIS (on Terra and Aqua), MISR, OMI, POLDER, CALIOP, and SeaWiFS. Samples of satellite aerosol products are extracted over Aerosol Robotic Network (AERONET) locations as well as over other locations of interest such as those with available ground-based aerosol observations. In this way, MAPSS enables a direct cross-characterization and data integration between Level-2 aerosol observations from multiple sensors. In addition, the available well-characterized co-located ground-based data provides the basis for the integrated validation of these products. MAPSS provides a consistent sampling approach that enables easy and direct inter-comparison and ground-based validation of the diverse aerosol products from different satellite sensors in a uniform and consistent way. The range of statistics collected in MAPSS facilitates the investigation of various spatio-temporal properties of aerosols, as observed from multiple sensors with complementary capabilities, thereby helping to expand understanding of the distribution and environmental impact of aerosols from different perspectives at local scales, with the possibility of extension by aggregation to global scales. The readily available unified access to distinct aerosol parameters from multiple sensors provides a platform for acquiring a more complete understanding of the interrelationships that may exist between the different physical properties of aerosols, which cannot all be measured from one or even a few sensors.

STAGE OF DEVELOPMENT

Software

CONTACT INFO

UM Ventures
0134 Lee Building
7809 Regents Drive
College Park, MD 20742
Email: umdtechtransfer@umd.edu
Phone: (301) 405-3947 | Fax: (301) 314-9502

Additional Information

INSTITUTION

University of Maryland, College Park

EXTERNAL RESOURCES

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