Ground-based Network and Supersite Observations to Complement and Enrich EOS Research

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Since 1997 NASA has been successfully launching a series of satellites – the Earth Observing System (EOS) – to intensively study, and gain a better understanding of, the Earth as an integrated system. Space-borne remote sensing observations, however, are often plagued by contamination of surface signatures. Thus, ground-based in-situ and remote-sensing measurements, where signals come directly from atmospheric constituents, the sun, and/or the Earth-atmosphere interactions, provide additional information content for comparisons that confirm quantitatively the usefulness of the integrated surface, aircraft, and satellite datasets. Through numerous participations, particularly but not limited to the EOS remote-sensing/retrieval and validation projects over the years, NASA/GSFC has developed and continuously refined ground-based networks and mobile observatories that proved to be vital in providing high temporal measurements, which complement and enrich the satellite observations. These are: the **AERONET** (**AE**rosol **RO**botic **NET**work, http://aeronet.gsfc.nasa.gov/), a federation of ground-based globally distributed network of spectral sun-sky photometers; the **MPLNET** (**M**icro-**P**ulse **L**idar **NET**work, http://mplnet.gsfc.nasa.gov/), a similarly organized network of micro-pulse lidar systems measuring aerosol and cloud vertical structure continuously; and the **SMART–COMMIT** (**S**urface-sensing **M**easurements for **A**tmospheric **R**adiative **T**ransfer – **C**hemical, **O**ptical & **M**icrophysical **M**easurements of **I**n-situ **T**roposphere, http://smartlabs.gsfc.nasa.gov/) mobile observatories, a suite of spectral radiometers and in-situ probes acquiring supersite measurements.

Most MPLNET sites are collocated with those of AERONET, and both networks always support the deployments of SMART-COMMIT worldwide. These data products follow the data structure of EOS conventions: Level-0, instrument archived raw data; Level-1 (or 1.5), real-time data with no (or limited) quality assurance; Level-2, not real

high temporal and spectral resolutions. In this talk, we will present NASA/GSFC ground-based facilities (Figure 1 for an overview), serving as network or supersite observations, which have been playing key roles in major international research projects over diverse aerosol regimes to complement and enrich the EOS scientific research.

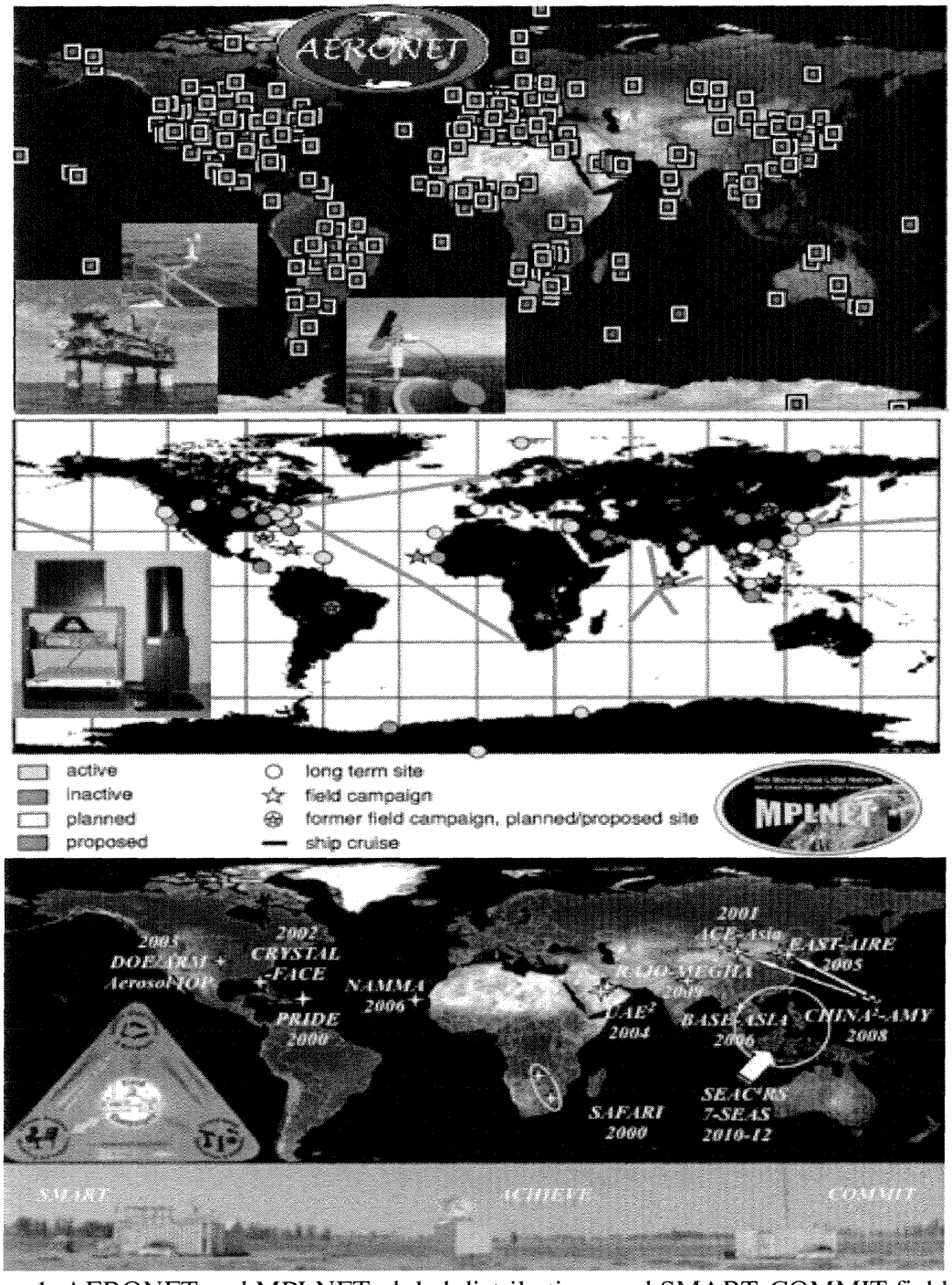

Figure 1. AERONET and MPLNET global distributions and SMART-COMMIT field deployments during past decade