P1.6   CALIPSO DATA AT THE NASA LANGLEY ATMOSPHERIC SCIENCE DATA CENTER

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1. INTRODUCTION

The NASA Langley Atmospheric Science Data Center (ASDC) is the archive and distribution center for data from the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations (CALIPSO) instrument. CALIPSO was launched into a sun-synchronous orbit on April 28, 2006, where it joined the A-Train constellation of four other Earth-orbiting satellites: Aqua, Aura, CloudSat and PARASOL. The primary objective of CALIPSO's three-year mission is to make a global survey of the vertical structure of clouds and aerosols and their physical properties.

2. CALIPSO INSTRUMENTS

CALIPSO comprises three instruments, the Cloud-Aerosol LIdar with Orthogonal Polarization (CALIOP), the Imaging Infrared Radiometer (IIR), and the Wide Field Camera (WFC). CALIOP is a two-wavelength, polarization-sensitive lidar that provides information about the composition of clouds, the abundance and sizes of aerosols, and the altitudes of cloud and aerosol layers. The IIR measures outgoing radiation at three wavelengths in the thermal infrared window (8.65 mm, 10.6 mm, and 12.0 mm) to determine cloud emissivity and particle size. The high resolution, nadir-viewing WFC images the region around the lidar and IIR measurements in a single spectral channel (645 nm), which is matched to Band 1 of the MODIS instrument on the Aqua satellite in the A-Train, to provide context for data from the other two instruments.

3. CALIPSO DATA PRODUCTS

CALIPSO produces Level 1 and Level 2 archived science data products. The Level 1 data include:
- lidar calibrated and geolocated profiles for the day and night portions of the orbit, with associated browse imagery
- IIR geolocated, calibrated radiances registered to a 1 km grid centered on the lidar track
- WFC geolocated radiances at 125 m and 1 km resolution for the daytime portion of each orbit

Level 2 products include:
- a cloud layer product with horizontal resolutions of 1/3 km, 1 km and 5 km which includes cloud height, thickness, backscatter, extinction, ice/water phase, emissivity, and ice particle size
- an aerosol layer product at 5 km resolution which includes height, thickness, optical depth, and integrated attenuated backscatter
- an aerosol profile product with a horizontal resolution of 40 km and vertical resolution of 120 m which includes backscatter, extinction, and depolarization ratio
- IIR Level 2 cloud emissivity and particle size in 1 km pixels, with a 70 km swath width co-located to the lidar track

4. CALIPSO DATA AND INFORMATION

CALIPSO data ordering methods, documentation, software tools for working with the data, and links to related sites are available from the ASDC web site: http://eosweb.larc.nasa.gov. Public release of CALIPSO data is expected by the end of 2006.

The ASDC provides data access, services and tools for over 35 projects in the discipline areas of Earth's radiation budget, clouds, aerosols and tropospheric chemistry. These data and services are available free of charge through the web site listed above.

5. CONCLUSION

CALIPSO data are providing new insights into aerosols, including volcanic emissions, dust storms, and pollution events, and clouds, including thin cirrus and Polar Stratospheric clouds. The following pages contain examples of features observed in CALIPSO Lidar browse imagery. Images provided by the NASA LaRC CALIPSO team.

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* *Corresponding author address*: Science, User and Data Services, Atmospheric Science Data Center, NASA Langley Research Center, MS 157D, Hampton, VA 23681-2199; e-mail: larc@eos.nasa.gov
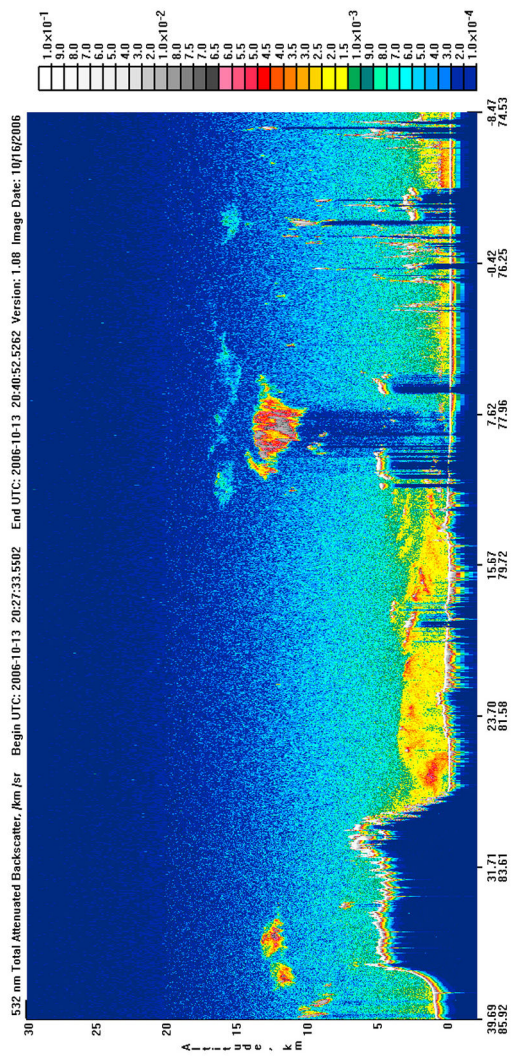
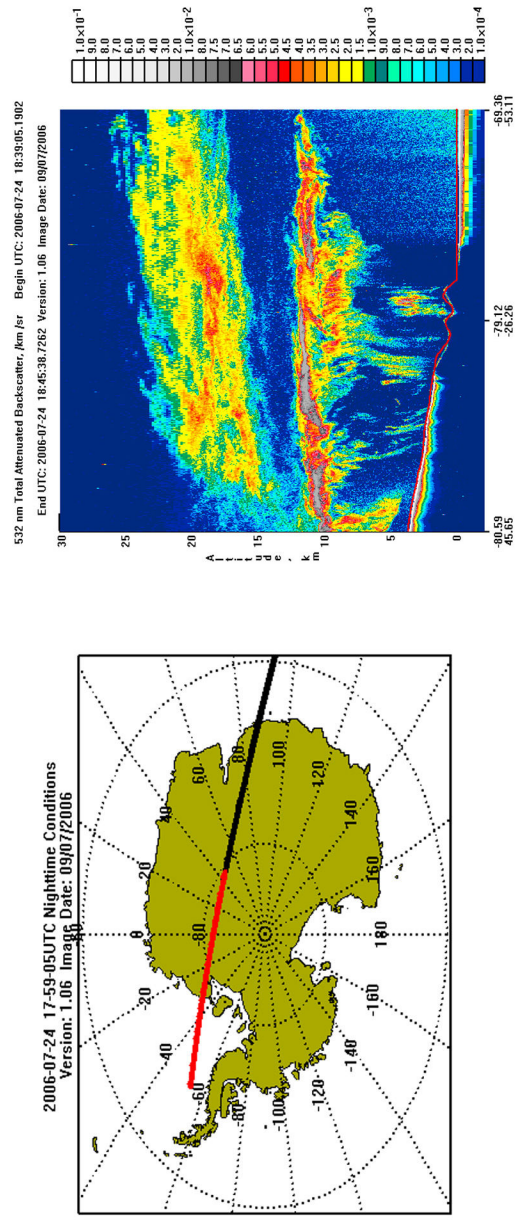Figure 1. Himalayan Mountains and pollution pool over northern India.

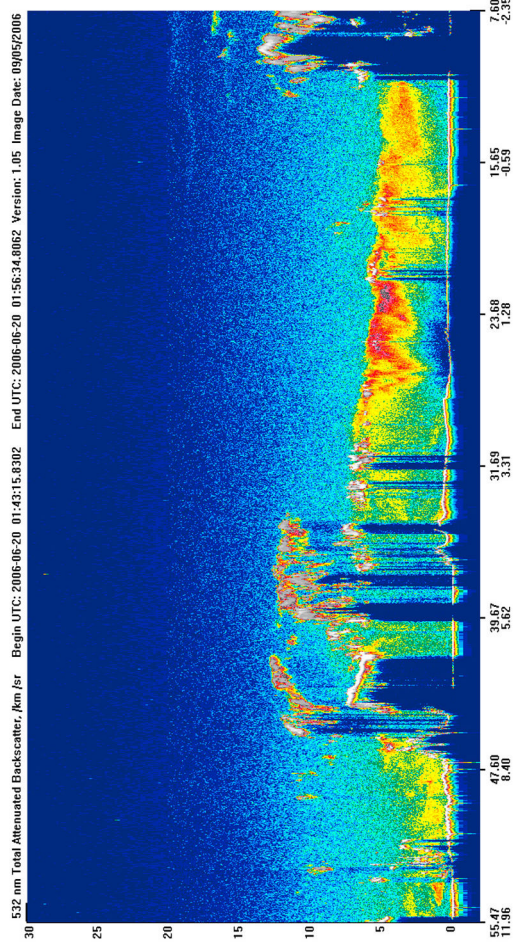Figure 2. Polar Stratospheric Clouds over Antarctica.

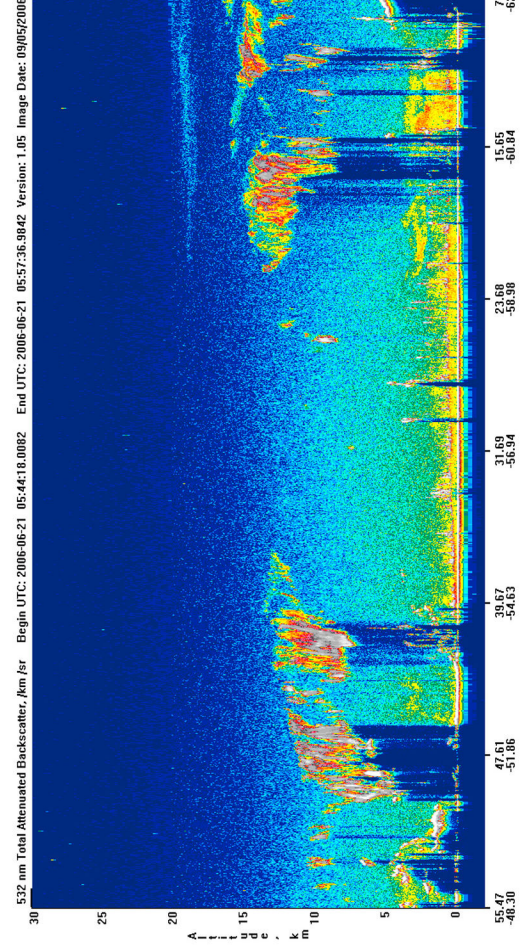**Figure 3. Dense dust storm over northwest Africa.**

Figure 4. Saharan dust transported over the Caribbean; stratospheric remnants of the May 21 dome collapse of Montserrat's Soufriere Hills volcano (image upper right); aerosol over the Atlantic.