Cloud-Aerosol Transport System

CATS Science Applications and Publications

The Cloud-Aerosol Transport System (CATS) provided diurnally varying vertical profiles of clouds and aerosols in near real time (NRT) from the International Space Station (ISS) to demonstrate the Earth science remote sensing capabilities of the ISS. CATS was an elastic backscatter lidar employing photon counting detection and two high-repetition rate lasers that have operated at 532 and 1064 nm. CATS operated on the ISS from 10 February 2015 to 29 October 2017. During its 33 months of operation, CATS generated over 200 billion laser pulses on-orbit and operated as continuously as possible within ISS safety constraints (~65% duty cycle). There are several science applications of the CATS data, such as long-range aerosol transport, diurnal variability of clouds and aerosols, vertical structure of dust plumes, and cloud/aerosol radiative forcing. A full list of the 27 publications using CATS data as August 2020 are given at below. There are also several publications under review, so we encourage CATS data users to search Google Scholar for the latest CATS publications and conference presentations.

There are at least 27 publications that use CATS data as of August 2020.

#	Citation	Journal	Subject
1	McGill et al. [2020]	Journal of South African Science	Long-range smoke transport
2	O'Sullivan et al. [2020]	Atmospheric Chemistry and Physics	Dust Plume Vertical Strcture
3	Dolinar et al. [2019]	Geophysical Research Letters	Cirrus Radiative Forcing
4	Baray et al. [2019]	Atmosphere	Cloud Diurnal/Seasonal Variability
5	Wu et al. [2019]	Atmospheric Environment	Aerosol/PBL Diurnal Variability
6	Chepfer et al. [2019]	Nature	Cloud Diurnal/Seasonal Variability
7	Chazette [2019]	Atmospheric Chemistry and Physics	Smoke Transport Characterization
8	Feofilov & Stubenrauch [2019]	Atmospheric Chemistry and Physics	Cloud Diurnal Variability
9	Callewaert et al. [2019]	Atmospheric Measurement Techniques	Dust Plume Altitude Validation
10	Yu et al. [2019]	Atmospheric Chemistry and Physics	Dust Diurnal Variability
11	Pauly et al. [2019]	Atmospheric Measurement Techniques	CATS Calibration and Validation
12	Lee et al. [2019]	Atmospheric Chemistry and Physics	Aerosol Diurnal Variability
13	Christian et al. [2019]	Geophysical Research Letters	PyroCb Detection/Radiative Forcing
14	Proestakis et al. [2018]	Atmospheric Chemistry and Physics	Validation of CATS L2 products
15	Chen et al. [2018]	Atmospheric Environment	Long-Range Dust Transport to US
16	Kar et al. [2018]	Remote Sensing of Environment	Smoke Vertical Structure
17	Vaughan et al. [2018]	Atmospheric Measurement Techniques	CALIPSO/CATS Calibration
18	Lu et al. [2018]	Proceedings National Academy of Sciences	Smoke Vertical Structure
19	Marenco et al. [2018]	Atmospheric Chemistry and Physics	Dust Vertical Structure
20	Noel et al. [2018]	Atmospheric Chemistry and Physics	Cloud Diurnal Variability
21	Stachlewska et al. [2018]	Remote Sensing	Long-Range Smoke Transport
22	Vaughan et al. [2018]	Atmospheric Chemistry and Physics	Long-range smoke transport
23	Rajapakshe et al. [2017]	Geophysical Research Letters	Seasonal aerosol transport
24	Thorsen et al. [2017]	Geophysical Research Letters	Aerosol radiative forcing
26	Hughes et al. [2016]	Geophysical Research Letters	Volcanic Plume Transport
27	Yorks et al. [2016]	Geophysical Research Letters	CATS Algorithm Description