

TITLE: 3-wavelength total and submicron aerosol scattering coefficients

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1.0 DATA SET OVERVIEW:

3-wavelength total and submicron aerosol scattering coefficients data for the Pacific Atmospheric Sulfur Experiment (PASE). Collected on the NCAR C-130 in Aug-Sept, 2007 from Kiribati (Christmas) Island, Republic of Kiribati.

2.0 INSTRUMENT DESCRIPTION:

The 3-wavelength total and submicron aerosol scattering coefficients measured with TSI 3563 nephelometer inside C-130. The air was sampled through the NCAR Inlet. The data have been corrected for the ambient temperature and pressure based on the ideal gas law. They represent the values under the instrument RH conditions, and adjustment to the ambient humidity requires additional information on aerosol hygroscopicity. The nephelometer scattering coefficients have been corrected for 0 - 180 degree from the nephelometer detection angle (7 - 170 degree) based on Anderson and Ogren, Aerosol Science and Technology, 1998. The submicron scattering coefficients are for the particles that passed an impactor with 1 um cut.

3.0 DATA COLLECTION AND PROCESSING:

The scattering coefficients measured with TSI 3563 nephelometer inside C-130. The air was sampled through the NCAR Inlet. The data have been corrected for the ambient temperature and pressure based on the ideal gas law. They represent the values under the instrument RH conditions, and adjustment to the ambient humidity requires additional information on aerosol hygroscopicity. The TSI nephelometer total scattering coefficients have been corrected for 0 - 180 degree from the nephelometer detection angle (7 - 170 degree) based on Anderson and Ogren, Aerosol Science and Technology, 1998.

The submicron scattering coefficients are for the particles that passed an impactor with 1 um cut. The impactor was taken off occasionally for instrument check. Data influenced by droplet shatter have been removed. The lower detection limit is 1.9, 0.70, 1.1 Mm-1 for the total scattering coefficient at 450, 550 and 700 nm, respectively.

4.0 DATA FORMAT:

Data for each flight is supplied in its own file. Filenames are structured as (for example):
RF03_20070813T175221_SCAT_v1.txt
RAF flight number _ start_time_measured parameter _ version . file type ascii text
Standard EOL data archive header information is first followed by a NASA-NOAA header information style precluded by "REMARKS =" identifier.

EXAMPLE HEADER and 3 lines of data

```
PI/DATA CONTACT = Antony Clarke, 1000 Pope Road, Honolulu, HI 96822; email: tclarke@soest.hawaii.edu; 808-956-6215
DATA COVERAGE = START: 20070901191424; STOP 20070902025954 UTC
PLATFORM/SITE = C-130
INSTRUMENT = Nephelometer
LOCATION = mobile
DATA VERSION = 1.0 (20080325)
REMARKS = Pacific Atmospheric Sulfur Experiment (PASE)
REMARKS = Sample Start time yyymmddhhmmss, UTC
REMARKS = Sample Start time Matlab format, UTC
REMARKS = Sample Start time, seconds
REMARKS = TOTAL450nmecat, Mm-1
REMARKS = TOTAL550nmecat, Mm-1
REMARKS = TOTAL700nmecat, Mm-1
REMARKS = SUBMICRON550nmecat, Mm-1
REMARKS = InstrumentRH, %
REMARKS = missing data NaN
REMARKS = NASA-NOAA HEADER INFORMATION FOLLOWS
REMARKS = 38 1001
REMARKS = Clarke, Antony
REMARKS = HiGEAR/University of Hawaii
REMARKS = Aerosol scattering coefficients measured with TSI nephelometers aboard NSF C-130
REMARKS = PASE
REMARKS = 1 1
REMARKS = 2007 08 04 2007 09 08
REMARKS = 0
REMARKS = Start.UTC, second
REMARKS = 7
REMARKS = 1 1 1 1 1 1
REMARKS = -9999 -9999 -9999 -9999 -9999 -9999 -9999
REMARKS = TOTAL450nmecat, Mm-1
REMARKS = TOTAL550nmecat, Mm-1
REMARKS = TOTAL700nmecat, Mm-1
REMARKS = SUBMICRON550nmecat, Mm-1
REMARKS = InstrumentRH, %
REMARKS = 0
REMARKS = 19
```

REMARKS = PI_CONTACT_INFO: Antony Clarke, 1000 Pope Road, Honolulu, HI 96822; email: tclarke@soest.hawaii.edu; 808-956-6215

REMARKS = PLATFORM: NSF C-130 aircraft

REMARKS = LOCATION: Lat, Lon, and Elev data in a separate file

REMARKS = ASSOCIATED_DATA: N/A

REMARKS = INSTRUMENT_INFO: The scattering coefficients measured with TSI 3563 nephelometer inside C-130 are given in 8 columns:

REMARKS = INSTRUMENT_INFO: 1. Start Time (UTC); 2. Stop Time (UTC); 3. Mid-point Time (UTC); 4. Total scattering coefficient (Mm-1) at 450 nm; 5. Total scattering coefficient (Mm-1) at 550 nm; 6. Total scattering coefficient (Mm-1) at 700 nm; 7. Submicron scattering coefficient (Mm-1) at 550 nm; 8. Instrument RH (%).

REMARKS = INSTRUMENT_INFO: The air was sampled through the NCAR Inlet. The data have been corrected for the ambient temperature and pressure based on the ideal gas law. They represent the values under the instrument RH conditions, and adjustment to the ambient humidity requires additional information on aerosol hygroscopicity. The TSI neph total scattering coefficients have been corrected for 0 - 180 degree from the nephelometer detection angle (7 - 170 degree) based on Anderson and Ogren, Aerosol Science and Technology, 1998.

REMARKS = INSTRUMENT_INFO: The submicron scattering coefficients are for the particles that passed an impactor with 1 um cut. The impactor was taken off occasionally for instrument check. Data influenced by droplet shatter have been removed. The lower detection limit is 1.9, 0.70, 1.1 Mm-1 for the total scattering coefficient at 450, 550 and 700 nm, respectively.

REMARKS = DATA_INFO: Unit is Mm-1 for all scattering data.

REMARKS = UNCERTAINTY: N/A

REMARKS = DM_CONTACT_INFO: Vladimir Kapustin and Vera Brekhovskikh, Dept. of Oceanography, University of Hawaii at Manoa, 1000 Pope Road, Honolulu, Hawaii 96822; 808-956-7777; kapustin@soest.hawaii.edu

REMARKS = PROJECT_INFO: PASE; 4 August - 8 September 2007, http://www.eol.ucar.edu/projects/pase/PASE_HomePage.html;

REMARKS = STIPULATIONS_ON_USE: N/A

REMARKS = OTHER_COMMENTS: N/A

REMARKS = REVISION: R0

REMARKS = R0: No comments for this revision

UTC MatlabTime	Start_UTC	TOTAL450nm	scat_per_Mm	TOTAL550nm	scat_per_Mm	TOTAL700nm	scat_per_Mm	SUBMICRON550nm	scat_per_Mm	TSInephRH
UTC	UTC	sec	Mm-1	Mm-1	Mm-1	Mm-1	Mm-1	Mm-1	RH	
20070906175400.0000	733291.7458333333	64440	-1.26	1.29	0.34	NaN	50			
20070906175401.0000	733291.7458449074	64441	-0.83	1.80	0.56	NaN	50			
20070906175402.0000	733291.7458564815	64442	-1.35	1.44	0.18	NaN	50			

5.0 DATA REMARKS:

None

6.0 REFERENCES:

Anderson, T. L. and J.A. Ogren, Determining aerosol radiative properties using the TSI 3563 integrating nephelometer, *Aerosol. Sci. Technol.*, 29, 57-69, (1998)

Clarke, A.D. (1991), A Thermo Optic Technique for Insitu Analysis of Size-Resolved Aerosol Physicochemistry, *Atmospheric Environment, Part A-General Topics*, 25, (3-4), 635-644.