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 VOCALS Experiment . Collected on the NCAR C-130.

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. Data influenced by droplet shatter have been preserved in files named *withclouds.ict. Data influenced by droplet shatter have been removed in files without "withcloud". 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):

SCAT_C130_20081102_R0.ict (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: 20081102060006; STOP: 20081102151936 UTC
PLATFORM/SITE = C-130
INSTRUMENT = Nephelometer
LOCATION = mobile
DATA VERSION = 1.0 (20090429)
REMARKS = VAMOS Ocean-Cloud-Atmosphere-Land Study (VOCALS)
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 = VOCALS
REMARKS = 2008 10 15 2008 11 15
REMARKS = Sample Midpoint time yyyymmddhhmmss, UTC
REMARKS = Sample Midpoint time Matlab format, UTC
REMARKS = Sample Start time, seconds
REMARKS = 10
REMARKS = Sample Stop time, seconds
REMARKS = Sample Midpoint time, seconds
REMARKS = TOTAL450nmscat, Mm-1
REMARKS = TOTAL550nmscat, Mm-1
REMARKS = TOTAL700nmscat, Mm-1
REMARKS = SUBMICRON450nmscat, Mm-1
REMARKS = SUBMICRON550nmscat, Mm-1
REMARKS = SUBMICRON700nmscat, Mm-1
REMARKS = InstrumentRH, %
REMARKS = missing data NaN
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 separte 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. 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 Oceanogarphy, University of Hawaii at Manoa, 1000 Pope Road, Honolulu, Hawaii 96822; 808-956-7777; kapustin@soest.hawaii.edu
REMARKS = PROJECT_INFO: VOCALS; 15 October - 15 November 2008, http://www.eol.ucar.edu/projects/vocals;
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 Stop_UTC Mid_UTC TOTAL450nmscat_per_Mm TOTAL550nmscat_per_Mm TOTAL700nmscat_per_Mm SUBMICRON450nmscat_per_Mm SUBMICRON550nmscat_per_Mm SUBMICRON700nmscat_per_Mm TSInephRH

```
UTC UTC sec sec sec Mm-1 Mm-1 Mm-1 Mm-1 RH
20081102060006.2150 733714.2500719163 21606 21616 21611 75.59 78.52 59.30 NaN NaN NaN 29
20081102060016.2150 733714.2501876571 21616 21626 21621 72.41 69.95 48.56 NaN NaN NaN 29
20081102060026.2150 733714.2503033978 21626 21636 21631 73.65 65.51 43.01 NaN NaN NaN 28
.
```

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.