TITLE: PCASP_1hz_Size distributions

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1. Data Set Overview:

The PCASP files contain size distributions of aerosol particles measured by the Passive Cavity Aerosol Spectrometer probe (PCASP).

2. Instrument description:

The Passive Cavity Aerosol Spectrometer probe (PCASP) is manufactured by Particle Measurement Systems, Inc. of Boulder CO, with updated data system by Droplet Mearurement Technologies, Inc. in Boulder (DMT). It consists of a scatter probe, which measures both of illuminating laser light when particles pass through it. The PCASP was polled at 1hz. The scatter pulse heights are binned into 20 channels that are defined by voltage levels spaced at equal Log(V) increments.

3. Data Collection and Processing:

The probe bins the pulse heights it measures into the 20 channels and provides a pulse height distribution each time it is polled. The data are transported via a serial line, and stamped with a synchronizing timestamp upon arrival at the central data system of the aircraft.

4: Data Format:

The data are provided in column tab delimited ASCII. Each row in the file corresponds to a given time. Missing data are indicated by a -9999. The column definitions are as follows. The pulse counts per channel have been converted to concentration per channel, i.e., number of particles per cubic centimeter for each channel. Thus total concentration of particles in the probe detection range is a simple sum of the numbers provided.

UTC mm:dd:hh:mm:ss.x universal time
CH1 CONC: Concentration of particles in channel 1.
CH2 CONC: Concentration of particles in channel 2.
CH3 CONC: Concentration of particles in channel 3.
CH4 CONC: Concentration of particles in channel 4.
CH5 CONC: Concentration of particles in channel 5.
CH6 CONC: Concentration of particles in channel 6.
CH7 CONC: Concentration of particles in channel 7.
CH8 CONC: Concentration of particles in channel 8.
CH9 CONC: Concentration of particles in channel 9.
CH10 CONC: Concentration of particles in channel 10.
CH11 CONC: Concentration of particles in channel 11.
CH12 CONC: Concentration of particles in channel 12.
CH13 CONC: Concentration of particles in channel 13.
CH14 CONC: Concentration of particles in channel 14.
CH15 CONC: Concentration of particles in channel 15.
CH16 CONC: Concentration of particles in channel 16.
CH17 CONC: Concentration of particles in channel 17.
CH18 CONC: Concentration of particles in channel 18.
CH19 CONC: Concentration of particles in channel 19.
CH12 CONC: Concentration of particles in channel 20.

5: Data Remarks:

Based on PSL and oil drop calibrations the following table of correspondence between channel boundaries and liquid water drop diameter has been established:

Channel:	Lower Bound	Upper Bound	Geometric Mean

	Diameter (μm)	Diameter (μm)	Diameter (μm)
CH 1	**0.1**	**0.109**	**0.104403**
CH 2	**0.109**	**0.118**	**0.113411**
CH 3	**0.118**	**0.128**	**0.122898**
CH 4	**0.128**	**0.138**	**0.132906**
CH 5	**0.138**	**0.152**	**0.144831**
CH 6	**0.152**	**0.162**	**0.15692**
CH 7	**0.162**	**0.175**	**0.168375**
CH 8	**0.175**	**0.191**	**0.182825**
CH9	**0.191**	**0.206**	**0.198358**
CH 10	**0.206**	**0.226**	**0.215768**
CH 11	**0.226**	**0.255**	**0.240062**
CH 12	**0.255**	**0.298**	**0.275663**
CH 13	**0.298**	**0.346**	**0.321104**
CH 14	**0.346**	**0.397**	**0.370624**
CH 15	**0.397**	**0.497**	**0.444195**
CH 16	**0.497**	**0.693**	**0.586874**
CH 17	**0.693**	**0.819**	**0.75337**
CH 18	**0.819**	**0.967**	**0.889929**
CH19	**0.967**	**1.24**	**1.095025**
CH20	**1.242**	**2.00**	**1.575**