

# **TITLE: Cip\_1hz\_Size distributions**

## **AUTHOR:**

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### **1. Data Set Overview:**

**The CIP files contain size distributions of cloud and precipitation particles measured by the Cloud and Precipitation Probe (CIP) section of the CAPS probe. The CIP was operated in 1-D mode.**

### **2. Instrument description:**

**The Cloud Aerosol and Precipitation Spectrometer (CAPS) is manufactured by Droplet Measurement Technologies Inc. in Boulder Colorado (DMT). It includes an occultation probe that determines the diameter of particles by measuring the shadow they cast upon an array of photo-detectors when they pass through a laser beam. The resolution of the probe is 25  $\mu\text{m}$  and the number of diodes in the array is 62. Thus the range is 25 to 1550  $\mu\text{m}$ .**

### **3. Data Collection and Processing:**

**The CIP probe bins the signals it measures into 62 channels and provides the resultant channel sums each time it is polled. The probe is polled every 1 second. The data are transported to a data acquisition system 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.*

*CH20 CONC: Concentration of particles in channel 20.*

*CH21 CONC: Concentration of particles in channel 21.*

*CH22 CONC: Concentration of particles in channel 22.*

*CH23 CONC: Concentration of particles in channel 23.*

*CH24 CONC: Concentration of particles in channel 24.*

*CH25 CONC: Concentration of particles in channel 25.*

*CH26 CONC: Concentration of particles in channel 26.*

*CH27 CONC: Concentration of particles in channel 27.*

*CH28 CONC: Concentration of particles in channel 28.*

*CH29 CONC: Concentration of particles in channel 29.*

*CH30 CONC: Concentration of particles in channel 30.*

*CH31 CONC: Concentration of particles in channel 31.*

*CH32 CONC: Concentration of particles in channel 32.*

*CH33 CONC: Concentration of particles in channel 33.*

**CH34 CONC: Concentration of particles in channel 34.**  
**CH35 CONC: Concentration of particles in channel 35.**  
**CH36 CONC: Concentration of particles in channel 36.**  
**CH37 CONC: Concentration of particles in channel 37.**  
**CH38 CONC: Concentration of particles in channel 38.**  
**CH39 CONC: Concentration of particles in channel 39.**  
**CH40 CONC: Concentration of particles in channel 40.**  
**CH41 CONC: Concentration of particles in channel 41.**  
**CH42 CONC: Concentration of particles in channel 42.**  
**CH43 CONC: Concentration of particles in channel 43.**  
**CH44 CONC: Concentration of particles in channel 44.**  
**CH45 CONC: Concentration of particles in channel 45.**  
**CH46 CONC: Concentration of particles in channel 46.**  
**CH47 CONC: Concentration of particles in channel 47.**  
**CH48 CONC: Concentration of particles in channel 48.**  
**CH49 CONC: Concentration of particles in channel 49.**  
**CH50 CONC: Concentration of particles in channel 50.**  
**CH51 CONC: Concentration of particles in channel 51.**  
**CH52 CONC: Concentration of particles in channel 52.**  
**CH53 CONC: Concentration of particles in channel 53.**  
**CH54 CONC: Concentration of particles in channel 54.**  
**CH55 CONC: Concentration of particles in channel 55.**  
**CH56 CONC: Concentration of particles in channel 56.**  
**CH57 CONC: Concentration of particles in channel 57.**  
**CH58 CONC: Concentration of particles in channel 58.**  
**CH59 CONC: Concentration of particles in channel 59.**  
**CH60 CONC: Concentration of particles in channel 60.**  
**CH61 CONC: Concentration of particles in channel 61.**  
**CH62 CONC: Concentration of particles in channel 62.**

## 5: Data Remarks:

The following table provides the correspondence between channel boundaries and drop diameter for the CIP probe:

Channel:	Lower Bound Diameter ( $\mu\text{m}$ )	Upper Bound Diameter ( $\mu\text{m}$ )	Geometric Mean Diameter ( $\mu\text{m}$ )
CH1	15.45085	40.45085	25
CH2	40.45085	64.03882	50.896215
CH3	64.03882	88.534532	75.297058
CH4	88.534532	113.278222	100.145066

CH5	113.278222	138.123445	125.085484
CH6	138.123445	163.019932	150.056238
CH7	163.019932	187.945861	175.039771
CH8	187.945861	212.890244	200.029598
CH9	212.890244	237.846955	225.022879
CH10	237.846955	262.812305	250.018212
CH11	262.812305	287.783944	275.014839
CH12	287.783944	312.760304	300.012323
CH13	312.760304	337.740296	325.010396
CH14	337.740296	362.723143	350.008888
CH15	362.723143	387.708275	375.007686
CH16	387.708275	412.695265	400.006712
CH17	412.695265	437.683784	425.005912
CH18	437.683784	462.673578	450.005247
CH19	462.673578	487.664445	475.004688
CH20	487.664445	512.656226	500.004214
CH21	512.656226	537.648788	525.003808
CH22	537.648788	562.642027	550.003458
CH23	562.642027	587.635854	575.003155
CH24	587.635854	612.630194	600.002889
CH25	612.630194	637.624988	625.002656
CH26	637.624988	662.620181	650.00245
CH27	662.620181	687.615731	675.002267
CH28	687.615731	712.611598	700.002104
CH29	712.611598	737.607751	725.001957
CH30	737.607751	762.604159	750.001826
CH31	762.604159	787.6008	775.001707
CH32	787.6008	812.59765	800.0016
CH33	812.59765	837.594692	825.001502
CH34	837.594692	862.591907	850.001413
CH35	862.591907	887.589281	875.001332
CH36	887.589281	912.586801	900.001257
CH37	912.586801	937.584456	925.001189
CH38	937.584456	962.582233	950.001126
CH39	962.582233	987.580125	975.001068
CH40	987.580125	1012.578122	1000.001014
CH41	1012.578122	1037.576217	1025.000964
CH42	1037.576217	1062.574402	1050.000918
CH43	1062.574402	1087.572672	1075.000875
CH44	1087.572672	1112.57102	1100.000835
CH45	1112.57102	1137.569442	1125.000798
CH46	1137.569442	1162.567933	1150.000763
CH47	1162.567933	1187.566487	1175.00073
CH48	1187.566487	1212.565102	1200.0007
CH49	1212.565102	1237.563774	1225.000671
CH50	1237.563774	1262.562498	1250.000644

<b>CH51</b>	<b>1262.562498</b>	<b>1287.561273</b>	<b>1275.000619</b>
<b>CH52</b>	<b>1287.561273</b>	<b>1312.560095</b>	<b>1300.000595</b>
<b>CH53</b>	<b>1312.560095</b>	<b>1337.558961</b>	<b>1325.000572</b>
<b>CH54</b>	<b>1337.558961</b>	<b>1362.557869</b>	<b>1350.000551</b>
<b>CH55</b>	<b>1362.557869</b>	<b>1387.556817</b>	<b>1375.000531</b>
<b>CH56</b>	<b>1387.556817</b>	<b>1412.555802</b>	<b>1400.000512</b>
<b>CH57</b>	<b>1412.555802</b>	<b>1437.554824</b>	<b>1425.000494</b>
<b>CH58</b>	<b>1437.554824</b>	<b>1462.553878</b>	<b>1450.000477</b>
<b>CH59</b>	<b>1462.553878</b>	<b>1487.552965</b>	<b>1475.00046</b>
<b>CH60</b>	<b>1487.552965</b>	<b>1512.552082</b>	<b>1500.000445</b>
<b>CH61</b>	<b>1512.552082</b>	<b>1537.551229</b>	<b>1525.00043</b>
<b>CH62</b>	<b>1537.551229</b>	<b>1562.550402</b>	<b>1550.000416</b>