Second DRI CCN spectral input for POST, November 15, 2024

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This is the second DRI CCN spectral input with more detailed spectra than the first DRI CCN POST data set. Data is arranged in rows and columns. The rows show the supersaturation, S, in percent from the highest to the lowest S from left to right for each of the 14 flights from July 18 to August 15. Concentrations in number per cubic centimeter (cm^{-3}) are in rows directly under the S rows for each of the flights. For two of the flights, July 21 & 27 the same S row corresponds to both of these dates. For the other 12 flights there are unique S rows that apply only to each flight. The time of the measurements is shown in the columns immediately to the right of the date column. These are decimal hours in local Pacific Daylight Time (PDT). The beginning (begtime) and endtime (etime) of these measurements are shown. The numbers to right of the decimal points are the fraction of the hour after the number of hours to the left of the decimal point. These cumulative concentrations are the number of particles (CCN) that are active at the corresponding S of each column. These concentrations should decrease or remain the same when reading from left to right toward lower S. There are different numbers of columns for each date as there are different unique calibrations for each flight except July 21 & 27, which use the same calibration. These CCN measurements were made at low altitudes below the POST stratus clouds. This data set of CCN was used in Hudson & Noble (2024) for comparisons of CCN spectra with POST cloud and drizzle drop measurements. These are final data as they have been used in this publication. These data are not restricted in any way.

The DRI CCN spectrometers (Hudson, 1989) obtain concentrations by individually photoelectrically counting droplets that exit a cloud chamber with a set of increasing supersaturations that spread the resulting droplet spectrum that grows on the CCN. Larger droplets are produced by better CCN that have lower critical S (S_c). Pulses from the photoelectric record are sorted according to size as the droplets are individually counted and sized as they exit the cloud chamber by a ROYCO optical particle counter. The sample flowrate is measured before the aerosol sample enters the cloud chamber. Particle-free filtered air surrounds the sample as it passed through the cloud chamber. The device must be calibrated with particles of know S_c that are produced by an atomizer that makes a spray of particles of know composition either sodium chloride or ammonium sulfate, which is then passed through an electrostatic classifier that only passes particles within a narrow size range. With a known composition and size the S_c of the particles can be calculated. A calibration curve is then applied to the output voltages so that the S_c of the particles corresponds to the voltage levels. These are sorted into 256 channels. Due to many factors the actual useful number of channels is somewhat less than 256. But a spectrum of concentrations per cm^3 versus S is obtained as the output.

Hudson, J. G., & Noble, S., 2024. Stratus and stratocumulus cloud microphysics and drizzle relationships with CCN modality. *Journal of Geophysical Research: Atmospheres*, *129*,e2024JD041965. https://doi.org/10.1029/2024JD41965

Hudson, J.G., 1989: An instantaneous CCN spectrometer. *J. Atmos. & Ocean. Techn.*, **6,** 1055-1065.

NSF ATM-0734441 supported the POST CCN measurements.