Input data file descriptions

(based on conversations with Rahul, spring 2025)  
(?) denotes something that I am unsure about, or have not verified with Rahul, or is not clear from data files.

**Biomodal\_parameters.csv**: fitted and scale parameters for two aerosol size modes.   
mode1\_d, mode2\_d = median diameter (nm), mode1\_sigma, mode2\_sigma = standard deviation, and mode1\_n, mode2\_n = number concentration (cm^-3).   
NOTE: modeX\_n is not scaled to the observed NSD. This should not be used for parameter fitting.  
This is calculated by: first calculate the median of the size distributions in each CCN-window, then do bimodal fitting.  
Data is harmonized to the 2-hour CCN observation windows. 6580 time-stamps.

**CCN.csv:** CCN concentration at 5 super-saturations (0.1%. 0.2%, 0.3%, 0.5%, 1.0%)  
SC1, SC2, SC3, SC4, SC5 (cm^-3)  
2-hour windows. 6580 timestamps.

**CCN\_all.csv:** raw CCN observations  
includes start and end times of the CCN observation windows, and concentrations at 5 SS.  
24304 timestamps.

**Comp.csv:** mass fractions for different species (organic, NH4SO4, NH4NO3, BC) and total mass.   
median (?) values over CCN-observation windows  
6580 timestamps

**MAD.csv:** Mean absolute deviation of bimodal parameters within the CCN-observation windows.  
14272 timestamps

**NSD\_mode1.csv:** Number size distribution vector at 53 size bins (defined in Dp.txt) for mode 1, calculated with size\_distribution() from the fitted bimodal parameters.   
6580 timestamps

**NSD\_mode2.csv:** Number size distribution vector at 53 size bins (defined in Dp.txt) for mode 2, calculated with size\_distribution() from the fitted bimodal parameters.   
6580 timestamps

**NSD\_PARAMS\_SCALED.csv:** fitted bimodal parameters at 10min resolution (not sure of data source/instrument ?)  
modeX\_d, modeX\_sigma, modeX\_n, NSDx\_sum.  
NOTE: NSDx\_sum is the number concentration scaled to the observations. This should be used for the parameter fitting instead of modeX\_n.  
168105 timestamps

**ACSM\_eBC\_with\_inorganics.csv:** ACSM aerosol raw observations, 1 hr resolution, (organic,   
NH4SO4, NH4NO3, BC) and total mass.  
14913 timestamps

**Bimodal\_params\_range.csv:** range of fitted bimodal parameters within each CCN-observation window (parameters plus min and max) mode1\_d,mode1\_sigma,mode1\_n,mode2\_d,mode2\_sigma,mode2\_n,mode1\_d\_min,mode1\_d\_max,mode2\_d\_min,mode2\_d\_max,mode1\_n\_min,mode1\_n\_max,mode2\_n\_min,mode2\_n\_max.  
NOT SURE if this has the scale number concentration or not, as in other files it is called NSDx\_sum?  
6580 timestamps

**Dp.txt:** particle radius for number size distribution bins   
53 bins.

**bimodal\_params\_windows.csv:** re-calculated **median bimodal parameters** for each CCN\_window from NSD\_params\_all.csv. So the bimodal parameters are fitted to the raw size distribution data, then the median, max, and min are calculated within each CCN window. Note that this results in slightly different values to bimodal\_params.csv because there the size distribution is averaged over the window first before the fitting is done.

**NSD\_params\_withwindows.csv:** intermediate file to calculate above median, min/max parameters. This is the fitted NSD parameters at the raw aerosol observation resolution (NSD\_PARAMS\_SCALED.csv) with an extra column added that indicates which CCN window the data belongs to.

**Mass\_from\_median\_NSDparams.csv:** total aerosol mass calculated using the median NSD parameters. Used for mass constraint in method 1 of parameter optimization.