Review ESSD-2020-276, Christchurch PM2.5

Instruments and measurement strategies well-documented. Data well ordered and easy to access via Zenodo. Good (.nc) formats. Very good intercomparison and uncertainty discussion, covering both instrument performance (precision) and reference variances (approximates accuracy).

Three (winter) month experiment, with pre- and post-experiment intercalibration periods. Actual measurement campaign perhaps 80 days but with several failures / time sync problems on ODIN sensors. Need a figure showing time periods of valid data for all or most sensors?

Data organized into files by location. Reader would need to extract and re-compile to reproduce e.g. Figure 8 or Figure 9. Authors could provide data extracts using their preferred tools for each or for key figures?

A bit hard to decipher symbols on Fig 2; need something larger or with greater contrast? Despite multiple attempts, I never did identify location of 17 ES-642; I also derived a different count on each of several attempts. Despite statement at line 140 that AWS were deployed at perimeter of city, I see one AWS symbol almost dead centre on the map. Dead centre = perimeter?

Line 145: "12 balloon-borne radiosondes". Sites, or sonde launches. 12 launches over three months not very helpful unless authors know from other measurements that atmosphere vertical profile remains very stable day and night and that horizontal advection remains minimal?

Line 190: Without knowing Christchurch landmarks, these sites are not obvious (and not labelled) on Figure 2.

No RH measurements or corrections on TEOM despite same humidity depended particle aggregation / disaggregation?

Lines 202 and following: 'Unidata' mentioned here refers to an instrument manufacturer rather than to the US-based weather data provisioning service https://www.unidata.ucar.edu/? Google search does NOT return link to Unidata instruments.

Lines 206 and following: Figure 2 shows two AWS at western periphery of Christchurch airshed but - as mentioned above - one dead centre on map. The dead centre location represents the park?

Line 223, period of intense radiosonde launches indicates >> 12 radiosondes?

Line 229: miniMPL data only for months 2 and 3 of this deployment?

Lines 247 and following: reader learns here of 12 radiosonde launches, every four hours on each of two 24-hour periods. Hardly a "period of intense radiosonde launches"? Two days, with 4-hour resolution, out of roughly 80 days? Many field experiments, e.g. as far back as TOGA COARE (before birth of some of these co-authors) maintained launches every 6 hours for several consecutive months. Even with slow rise rate, two days out of roughly 80 does not constitute statistically valid survey of BL height or of its diurnal (diel) variation?

Figure 8: because ordinate ranges change substantially panel b vs panel, and more in for some wind directions than others, hard to certify the discussion of lines 501 to 513.