

The paper presents results from wind-tunnel and aircraft testing of a new CVI inlet. The authors use previously established wind-tunnel test procedure to characterize the CVI performance for conditions consistent with Twin Otter operation. The sampling performance determined from laboratory experiments is validated from analysis of aircraft-based measurements of cloud size distributions and total concentration downstream of the CVI. The paper is reasonably well written and the experiments and analysis are quite thorough. I have a few minor comments that are listed below, which I hope the authors can address.

Comments:

- 1) Page 1518: lines 24-25: “The pores allow the add-flow to enter the particle stream ... “ maybe better to rephrase as: “The pores allow the add-flow to enter into the inner sample-stream ...”
- 2) Page 1520: Line 8: How were the glass beads dispersed and introduced into the wind-tunnel?
- 3) Page 1520: Line 8: Figure 2 seems to suggest that the wind-tunnel experiments were conducted with the test particles injected close to the inlet, but no distance is mentioned. Could the large relaxation time of the test particles (esp particles larger than 15 μm) have resulted in their velocities at the CVI inlet be different from that in the freestream?
- 4) Page 1520: Line 26: I’m a little uncomfortable with the normalization scheme to compare the APS size distributions with and without the CVI. The idea behind the normalization, I believe, is to consider any changes in total concentrations that may occur between tests. My concern is the stability of size distributions. Were any lab studies conducted to confirm that the size distributions of the test beads generated were temporally consistent? Of particular concern would be the consistency of the concentrations of particles in the reference size range (17-20 μm)? Also, similar to Anderson (1993), it might be helpful to list the results (cut-size, slope) for both cases of with and without normalization.
- 5) 1521: line 10: The argument for changing the sampling curve sharpness definition from that used in Anderson (1993) is not clear.

- 6) 1522: Line 25: Were any experiments conducted with liquid droplets? Large liquid droplets may have lower transmission efficiency than correspondingly sized solid particles. From the field measurements, did the authors determine any decreased efficiency

- 7) 1525: line 20: I'm not entirely clear about the procedure used for comparison of the CPC data and the cloud probe data. It is my understanding that the net size-dependent enhancement factor of the CVI is the product of the EF, transmission efficiency (Figure 3), and transmission efficiency (Figure 4). Is that correct? It seems like the transmission efficiency (Figure 3) is ignored in the comparison analysis, with a sharp cut-size assumed for the CVI. This assumption will likely result in an error in the calculation of the expected cut-size, biasing the results to either smaller or larger sizes, depending on the shape of the cloud droplet size distribution.

- 8) The use of label "transmission efficiency for both figures 3 and 4 is confusing.