

Interactive comment on “Development and characterisation of a high-efficiency, aircraft-based axial cyclone cloud water collector” by Ewan Crosbie et al.

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Having been involved in the development of the first cyclone water collector developed by Straub and Collett, I am delighted to see that the idea has survived and that there is now a newer version that addresses some of the limitations of the first version.

I find little to critique in this manuscript as it is very well organized in sufficient detail for the reader to understand virtually every aspect of the design, from the mechanical structure to the airflow characteristics. The modeling that is done is adequate for doing the necessary sensitivity studies that were used to select the stator blade angles, as well as where to position the other critical components for extracting the water.

The questions that I have are not serious enough to delay publication, but perhaps the authors could say a word or two about the following:

1) Unless I somehow missed it, there seems to be no airflow modeling that takes into account the location of the AC3 on the Otter. Given that the AC3 is mounted on a pylon only 12 inches from the fuselage of the C-130, fairly far back from the nose, it is likely it is sampling cloud droplets, some whose concentrations are enhanced with respect to the free stream. Likewise, the mounting on the Twin Otter where the airflow might be less disturbed but possibly still somewhat disturbed. Something should be discussed in this regard in the manuscript.

2) How do attitude angle changes impact collection? I don't think this was mentioned?

3) It is mentioned that the water is pumped into the cabin but this must have only been on the C-130?

4) Figure 2C and the choice of 50 degrees, please amplify why this angle was chosen. A suggestion that in this figure the x axis should be D^3 not D . My reasoning is that both LWC and relaxation time depend on mass not diameter, hence the choice of 50 might be better explained if mass rather diameter is referred to since it is LWC that you are trying to maximize.

5) Are there plans for a wind tunnel study? I strongly recommend seeking funding to put the AC3 in the NASA Glenn wet wind tunnel.

6) Photos of the AC3 on the Twin Otter and C-130 would be very illustrative.

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Discussion paper

