Review of "A Level 3 Monthly Gridded Ice Cloud Dataset Derived from a Decade of CALIOP Measurements", by Winker and coauthors, MS No.: essd-2023-373.

This is an outstanding article that describes the 1) processing of CALIOP Level 3 monthly gridded ice cloud data, 2) the use of 10 years of data to characterize the global distribution of clouds through an optical depth of about 2, 3) its limitations, and 4) the comparison of CALIOP processed data to two other retrieval algorithms that use a combination of CALIOP and CloudSat radar data. The figures are very informative and very well done. I highly recommend acceptance of the article with minor suggestions and corrections.

Eq. (1). In the article cited, was ρ included in their derivation? I thought that an effective density, derived from direct measurements of the ice water content, was used in the development of the temperature-dependent equations.

What is the effect of contrails on the summary of CALIOP data, especially in the northern hemisphere?

Line 234, Figures 4 and 20. Shouldn't negative extinction coefficient values be rejected, as would be negative IWC values? Likewise, for the bins with negative IWC values.

Section 4.2, specifically ice cloud occurrence. Perhaps a better descriptor would be ice cloud fraction.

Figure 12. I'm not quite clear about the results shown, because the IWC generally decreases with temperature. Perhaps a bit more discussion would be helpful.

Section 6. This is a very interesting way to evaluate CALIPSO data utility by comparing the products to two products which retrieve most of the vertical column using a combination of lidar and radar.

Lines 440-442 You may want to mention that attenuation of the CloudSat W band radar can be significant, leading to errors in the DARDAR and 2C-ICE products.

Line 112. IWC directly measured

142: "underlying clouds"

Figure 10 is really interesting as it shows the changes due to the view angle of CALIOP.

Fig. 17. I don't see the black dots.

Figure 21 is very informative and insightful.