

## ***Interactive comment on “Deep convective clouds at the tropopause” by H. H. Aumann and S. G. DeSouza-Machado***

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Quote:

This very interesting analysis seems suggestive of pileus cloud features that are also seen in the "bulges" above deep convective cloud tops. For example, the article at <http://www.atmos-chem-phys.net/6/1185/2006/acp-6-1185-2006.html> shows in Fig. 1 pileus clouds above extremely deep convection near Darwin, Australia, that likely forms according to one of the vertical displacement mechanisms shown in the schematic in Fig. 10.

End of Quote.

Interesting that you see pileus clouds in "bulges" above DCC. The picture in Figure 1  
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of your paper is fascinating. Is it possible that the shape of the cap actually delineates the top of the bulge, i.e. the surface defined by the tropopause cold point?

In order to fit our observation we have to use optically thick clouds. We tried 20, 30 and 50 micron particles, but found that 30 micron gives the best fit. In your Figure 5 there are two areas of clouds colder than 210 K based the GOES data, which are associated with 4-6 micron particles. Pileus clouds may well be above the average DCC top, and may be remnants of Protruding Convective Bubbles, which seem to be imbedded in the tops of DCC.

Your Figure 10 and associated text scenario fits very well with our discussion on P16484 L24 of the cold bulges seen with the AIRS data. I will insert your reference and a pointer to your Figure 10.

Thanks

George Aumann

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 16475, 2010.