

Interactive comment on “Tropical tropospheric ozone derived using Clear-Cloudy Pairs (CCP) of TOMS measurements” by M. J. Newchurch et al.

Anonymous Referee #2

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General comments: This manuscript presents the Clear-Cloudy Pair (CCP) method of determining tropical tropospheric ozone. An attribute of the method is identification of high-altitude clouds using Temperature Humidity InfraRed measurements for 1979-84. The resulting tropospheric ozone is highly consistent with measurements from tropical ozonesondes. A few issues should be considered before publication in ACP.

Specific comments: Section 2 - please add a sentence quantifying the uncertainty in the THIR data, and the corresponding uncertainty in CCP ozone.

Section 5.3 Please add a sentence or two quantifying how ozone absorption within clouds is likely to affect CCP ozone following Newchurch et al., 2001. Could ozone absorption within clouds explain the 4 DU wave-1 in stratospheric ozone since there is more ozone over the tropical Atlantic than over the tropical Pacific?

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Please clarify the 2nd paragraph in section 5.3. If the SHADOZ data are regarded as independent of latitude, how can ozone in the Northern Hemisphere be six months out of phase with that in the Southern Hemisphere? It seems unreasonable to assume the SHADOZ data are independent of latitude or longitude given the large spatial variation in tropical ozone. The phrase, "corrections range from 5.5 to 5.5, and from 15 to 15" is especially confusing.

Please provide an estimate of the error in CCP ozone. Is the 4 DU wave-1 in stratospheric ozone statistically significant?

Figure 6 and Table 1 - The last sentence of the introduction notes that Ziemke et al. (1998) recommend removing 5 DU from the CCD data, but this is not done in the current manuscript. It seems misleading to show the CCD data without the recommended correction. Suggest showing the CCD data with the recommended correction, or not show the uncorrected data (the black lines).

Technical comments: 2nd line of section 4.2, suggest changing first comma to a period.

Suggest updating the references. Martin et al., 2001 was published in 2002 and Thompson et al., 2001 is in press.

Section 5.3, change "(OZAC) due ozone" to "(OZAC) due to ozone"

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 225, 2003.

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