

Interactive comment on “Long-lived contrails and convective cirrus above the tropical tropopause” by Ulrich Schumann et al.

Anonymous Referee #1

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This paper presents a convincing case for observations of contrails in the stratosphere from the Geophysica flights over Hector on 16 and 30 November 2005. It covers work already published in previous studies but has enough new material to warrant publication. I have only minor comments on the manuscript.

The paper is very long, very detailed and difficult to follow because of the complex nature of the dataset (this is not a criticism of the author but it does set a challenge). Peripheral sections should therefore be omitted or moved to the supplementary material. For example, Sections 3.2.5 and 3.2.6 (together with their associated diagrams) add little to the overall argument and could safely be omitted.

p.7 l.6 - gives the impression that there is always strong turbulence or some similar disturbance. I'm sure that's not the intention so please re-draft the sentence.

C1

p.7 l.33 'a remnant' rather than 'remainders'

p.8 l.27 'This cloud can be found as a narrow line in the 300° direction'

p.8 l.29 'the remains' rather than 'remainders'

p.9 l.18 'between this turn and the Falcon position.' But the Geophysica was always east of the Falcon camera position so how could the white line be between the Geophysica and the Falcon?

p.12 l.23 show not shows. Also, the tightness of the CO₂ scatter plot will be affected by the precision of the measurement. The paper gives a high-frequency noise of 0.05 ppmv which is very small but are there lower-frequency contributions to the random errors?

p.14 l.25 '.data; MAL is.'

p.15 l. 33 cause the optical depth to be underestimated

p.16 l.4 has not have; delete 'reaches' from next line

p.22 l.20 either 'during 30 November' or 'during the 30th November'

p.24 l.5 'in this altitude range' - which altitude range?

p.26 l.17 'Effective means,' should read 'By 'effective'; we mean. . .'

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-940, 2016.

C2