

Interactive comment on “Long-term tropospheric trend of octafluorocyclobutane

(c-C₄F₈ or PFC – 318)” by D. E. Oramet al.

Anonymous Referee #2

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This manuscript describes the measurement of tropospheric trends and distribution of octafluorocyclobutane (PFC-318) from a tropospheric air archive and from several airborne research missions. The measurements are significant because of the long lifetime and high global warming potential of this compound.

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Furthermore, in addition to the basic information on temporal trend and cumulative emission, the manuscript presents evidence that emissions have been considerably higher than those reported in existing emission inventory. I found the manuscript well-written and the technical aspects (standardization, measurement procedures, etc.) very credible well described. The authors are to be congratulated for this concise and well-organized manuscript. My main concern about the material is related to the estimated annual emissions derived from the Cape Grim archive. Because of the uncertainty in the source of the gas, the resulting temporal pattern of emission calculated from the 2D model should provide evidence of the changing source emissions. The peculiar results seem to shed no light on the potential unknown sources for

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PFC-318. The question then is how reasonable or uncertain is the derived emission history. It seems that the period of the 1990's has a greater variability in the measurements compared to more recent samples from the archive. It would help, I think, to present some discussion of how the measurement uncertainty impacts the derivation of the trend, and what is the resulting uncertainty in the emission history. One minor point. . .lines 1 – 5, p 19098 unnecessarily repeats the issue of the very small impact of non-ideal gas behavior presented earlier in the Experimental section (line 21, p. 19094).

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