

Interactive comment on “Global emission estimates and radiative impact of C₄F₁₀, C₅F₁₂, C₆F₁₄, C₇F₁₆ and C₈F₁₈” by D. J. Ivy et al.

Anonymous Referee #2

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This paper reports the results from an inverse method analysis of a comprehensive series of measurements of the atmospheric concentrations of C₄F₁₀, C₅F₁₀, C₆F₁₄, C₇F₁₆, and C₈F₁₈ over the time period 1973 to 2011. Annual global emission estimates for these species are inferred from 1980 to 2010. In addition to the emissions

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estimates, IR spectra are reported for C₇F₁₆ and C₈F₁₈ and radiative efficiencies and GWPs for these compounds are estimated. My comments are:

(1) The scientific analysis is of the highest quality and the results are very important in terms of both atmospheric science and environmental policy.

(2) I am surprised that the good news from the work that the atmospheric emissions of C₄F₁₀, C₅F₁₀, C₆F₁₄, C₇F₁₆, and C₈F₁₈ have decreased substantially from their peaks in the late 1990s is largely hidden within the body of the paper. This is a significant finding and should be highlighted more clearly in the abstract. From the data in Table 3, the combined emissions of C₄F₁₀, C₅F₁₀, C₆F₁₄, C₇F₁₆, and C₈F₁₈ have decreased from 2704 to 837 tonnes yr⁻¹ from 1997 to 2010. This is a very large reduction and it seems odd that this is

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not mentioned and discussed more explicitly in the abstract.

(3) The statement in the abstract that the EDGAR database underestimated the emissions of C5F12 by more than 3 orders of magnitude should be qualified to make it clear to the reader the very small quantities involved (9.6 kg global annual emissions in 2008 in EDGAR database, 67+/-53 tonnes from Table 3 of Ivy et al.).

(4) The radiative forcing impact of PFCs mentioned in the abstract should be placed into perspective with the radiative forcing from other long lived greenhouse gases such as CO₂, CH₄, N₂O and the CFCs which on an annual emissions basis is several orders of magnitude greater. My point is not that the radiative forcing effect of PFCs is negligible but that it needs to be placed in context with that from the principal greenhouse gases.

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