

A 2nd Review of “Improved FTIR retrieval strategy for HCFC-22 (CHClF₂), comparisons with in situ and satellite datasets with the support of models, and determination of its long-term trend above Jungfraujoch” by M. Prignon et al.

<General Comments>

The authors made a good effort to revise the draft. I felt that most of my concerns are cleared now. However, I have the last concern on the content of the paper, which is described below. After responding my last concern with a minor revision of the draft, I think the paper is almost ready to be published in ACP.

<The Last Concern>

1) On the cause of annual variation in FTIR tropospheric column, the authors explained that it is attributed to the intrusion of HCFC-22-poor stratospheric air at mid-latitudes Upper Troposphere/Lower Stratosphere (UTLS) at the time of the polar vortex breakdown. Such upper tropospheric annual variation was also seen by MIPAS data (Chirkov et al., 2016). This explanation is convincing to some extent. However, here arises another question: Why such annual variation is not seen in AGAGE JFJ data? If the intrusion of HCFC-22-poor stratospheric air is the cause of the annual variation, it should also be captured in AGAGE in-situ data to some extent. It is hard to understand that the intrusion will not affect the free tropospheric high-altitude in-situ Jungfraujoch data at all. Is it because “non-polluted” AGAGE JFJ data is used for the plot? What will happen if “all” the AGAGE JFJ data are plotted? Please add some more discussion on the cause of this discrepancy in annual variation between FTIR tropospheric data and AGAGE in situ data in the draft.