

Interactive comment on “Global stratospheric measurements of the isotopologues of methane from the Atmospheric Chemistry Experiment Fourier Transform Spectrometer” by E. M. Buzan et al.

Anonymous Referee #2

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This paper represent method for retrieval and assimilation of results on δD and $\delta^{13}C$ for methane in troposphere. The use of isotopes in methane can improve our understanding of stratospheric chemistry, and probably will help in quantifying sources of methane on the surface. The authors demonstrated that retrieval of methane isotopologues in stratosphere can be used for better understanding of chemistry providing methane sinks.

General comments

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Authors performed simultaneously spectral parameters adjustment for methane spectral lines “to improve fitting residuals” and then shifted retrieved profile to eliminate systematic error. I think the paper should be supplemented with some discussion on the reasons for spectral parameter adjustment. Maybe, it was worth making whole retrieval procedure without spectral parameters adjustment. Sometimes it is not possible to reach good fitting between measured and simulated spectra because of use of smoothed version of real atmosphere state (temperature and constituents distributions).

Specific comments

Authors pointed out on some artifacts of retrieval process. Representation of averaging kernel of retrieval algorithm can clarify what features in retrieved vertical profiles can be interpreted as artifacts and what can not.

Technical comments

I have no technical comments

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