

## Reply to editor comment, revised submission.

Dear Prof. Haynes,

thank you very much for your careful revision. The point you are referring to has been considered by us. Please see lines 821-829 in the discussion section (also see below) and excuse that we did not communicate this change, or rather addition, clear enough.

We only discussed the point very briefly because this complex topic goes beyond the scope of our study and I am convinced that the referee merely wanted the issue generally mentioned rather than analysed in depth.

Therefore, I did not perform any further changes now but uploaded the same manuscript file again. I hope this answer and our discussion are sufficient for the point.

Best regards  
Roland

For this point, we wrote:

*'As desired by Röckmann et al. (2011), this modelling approach can assist further studies, especially concerning the investigation of the isotope effects of the chemical sink reactions of methane isotopologues. For instance, Kaiser et al. (2002) and Röckmann et al. (2003) discuss the application of apparent rather than laboratory based fractionation factors ( $KIE_{app} = \sqrt{KIE}$ ) for long-lived trace gases that are removed in the stratosphere. While in the EMAC simulation the laboratory based fractionation factors lead to very good agreement with measurements, according to Röckmann et al. (2001) turbulent diffusion and mixing of air masses lead to significantly smaller fractionation factors.'*

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This answer refers to the following author comment:

**Editor Initial Decision: Reconsider after minor revisions (Editor review) (18 Apr 2015) by Peter Haynes**

*Comments to the Author:*

*My impression is that you have responded carefully and fully to the referees comments.*

*The one point that I do not find so clear is your response to the comment of Referee 2: 'The fact that the incorporation of laboratory based KIEs into a global model with independent OH, O1D and Cl fields leads to a very good agreement with the observed isotope-mole fraction relation as shown in Fig 3 could be discussed in more detail. It is not straightforward, since also mixing effects are important for the isotopic composition in the stratosphere.'*

*Have you responded to this comment and if so how and where? If not why not? If you satisfy me on this point then I will be pleased to accept the paper for publication.*