

Frank's comment:

thanks so much for the revised manuscript. This all looks fine, apart from one minor explanation you added as result of the communication with one of the referees (page 5, line 29): "the average of the WACCM v7 monthly means between 1980 and 2040 are applied for the a priori profiles of the target species and other interfering species except for H₂O, HDO, H₂¹⁷O and H₂¹⁸O (NCEP reanalysis)." To my knowledge, the NCEP reanalysis only provides H₂O profiles, but no information about the other H₂O isotopologues. Could you please be more specific on this point? (I guess you create the profiles of the isotopologues using some climatological abundance ratio profiles wrt the main isotopologue?)

Dear Frank,

Thanks for your comment. You are right that NCEP reanalysis only provides H₂O profiles but no information about other H₂O isotopes. Here, we use the NCEP reanalysis to set H₂O profiles as well as H₂O isotopes, assuming that the H₂O isotopes have the same variations as the main isotope (H₂O). Since the line intensities are scaled by the terrestrial isotopic fraction so that the same vmrs of H₂O and its isotopes will retrieve the correct amount from all isotopic lines of a particular. Of course, if we want to report the retrieved H₂O isotopes, we need to multiply the terrestrial isotopic fraction to the retrieved VMR.

Yours,

Minqiang and coauthors