Author's response to the comments of Dr. Matthew Johnson

April 7, 2012

We thank Matthew Johnson for his very supportive evaluation of our manuscript, and proceed to respond to his specific comments:

Scientific comments. 592, 10: As the authors note, many studies have been done concerning the isotope effects in the in situ production of hydrogen. Especially for the UT/LS, it is important to note that the photolytic deuterium fractionation in going from formaldehyde to molecular hydrogen is pressure dependent. Please see:
E. J. K. Nilsson, V. F. Andersen, H. Skov and M. S. Johnson, Pressure dependence of the deuterium isotope effect in the photolysis of formaldehyde by ultraviolet light, Atmospheric Chemistry and Physics, 10, 3455 - 3463, 2010.
In addition there is a pronounced isotope effect in the abstraction of hydrogen from the methoxy radical:
E. J. K. Nilsson, M. S. Johnson, F. Taketani, Y. Matsumi, M. D. Hurley and T. J. Wallington, Atmospheric Deuterium Fractionation: HCHO and HCDO Yields in the CH2DO + O2 Reaction, Atmospheric Chemistry and Physics, 7, 5873 5881, 2007.
These are indeed relevant points, and we will (very briefly) discuss them in the introduction section of the final paper.

Technical comments. The accepted convention is that the symbol m is reserved for mass thus the authors use of this symbol to mean mixing ratio is very confusing, and it is nonstandard. Mixing ratios/mole fractions should use the symbol x or y. See the IUPAC Green Book.International Union of Pure and Applied Chemistry (IUPAC) Quantities, Units and Symbols in Physical Chemistry, 3rd Ed., RSC Publishing, Cambridge 2007. Change throughout.
We agree that the "m"-notation can be confusing. We are, however, not familiar with the use of the "x"- or "y"- symbols for mixing ratios either, and to us these do not seem to be the usual symbols in atmospheric hydrogen research. We think the symbol $\chi(\ )$ is more common, and will replace the $m(\ )$'s with that.