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Discussions

Interactive comment on "First data set of H$_2$O/HDO columns from TROPOMI" by Andreas Schneider et al.

Anonymous Referee #2

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The manuscript "First data set of H2O/HDO columns from TROPOMI" by Schneider et al. introduces a new product of HDO/H2O δD global distributions measured by the TROPOMI instrument. The manuscript makes an important contribution to the science community and is very well written. It qualifies to be published as is by AMT.

However, I do feel that it will improve the paper significantly if there are more discussions on the information contents and sensitivities of the measurements. This can be shown in the form of jacobian or averaging kernels for vertical sensitivities. I am also concerned about the global δD latitudinal variations being a factor of temperature distributions (see Figure 7). The cause for this was described as "The general latitudinal gradient due to the temperature-dependence of the fractionation effects and progressive rain out of heavy isotopologues, the so-called latitudinal effect, is plain." In general,

thermal signals are sensitive to the surface thermal contrasts, which reflects measurement sensitivity. This often shows up as latitudinal variations in retrieved products or over higher ground (e.g., the Andes and the Himalayas). I don't know if the authors have studied these effects in the spectral region used. If yes, how would you attribute the latitudinal variations caused by temperature effects of the HDO/H2O physics vs the thermal contrast effects of remote sensing?

Also, since TROPOMI and VIIRS are on different platforms, how were the footprints matched? What was the error estimate in this step?

A very minor point: the Suomi National Polar-orbiting Partnership, should be S-NPP or SNPP, not just NPP.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-240, 2019.