This paper evaluated the vertical column densities of H2O and HDO retrieved from SCIAMACHY for the whole mission (2003 – 2012) using the non-scattering retrieval mode of the Shortwave Infrared CO Retrieval (SICOR) algorithm. The SCIAMACHY results were compared against the ground-based FTIR measurements from MUSICA. Reasonably high correlation coefficients and relatively small biases for H2O and HDO were obtained at the stations. δD was calculated a posteriori from H2O and HDO, and generally had larger errors. A comparison between the first and second half of the mission showed that the datasets were self-consistent.

This paper also assessed the benefit of the scattering retrieval mode of SICOR using a case study where the SCIAMACHY results for cloudy scenes were compared with high-altitude ground-based data. The most significant improvement was a clear reduction of the error in δD.

In general, the paper clearly conveyed the scientific findings. The results can provide guidance for SCIAMACHY data users. The method used can be useful for current and future missions.

The following suggestions may be considered:

(1) Use symbols in Figure 7 to show the locations of the MUSICA stations.
(2) Over the ocean, how do SCIAMACHY H2O data compare against satellite microwave data or other references?
(3) Provide a conversion factor from molec cm^-2 to mm for H2O, since the latter is commonly used in atmospheric science.
(4) Page 18 Line 14, change “similar resolution than SCIAMACHY” to something like “a similar spectral resolution to that of SCIAMACHY”.