SABER H_2O new v2.07 data product now available

SABER H_2O data have not been made publicly available up to now due to radiance errors of unknown origin and magnitude that recently were identified and corrected. The cause of the errors was determined to be unaccounted for spectral out-of-band radiance in the H_2O channel centered at 6.8μm arising from ozone emission in the 9.6μm band. The corrected SABER radiances have been used to produce a long-term H_2O data base labeled as version 2.07. Water vapor volume mixing ratio (VMR) vertical profiles are now available in the SABER data archive covering the stratosphere and mesosphere extending from near the tropopause at ~ 100hPa (~ 16km) up to the mesopause region at ~ 0.006hPa (~ 83km) and over the time period from January 25, 2002 to the present day. The random error of the v2.07 product is ≤ 3% at 60km and below, 10% at 70km and 30% at 80km. The rapid increase above 70km is mainly due to low signal-to-noise. The estimated systematic error of SABER version 2.07 H_2O is about 10-20%. Coincidence analysis between SABER v2.07, MLS v4.2, ACE v3.5-3.6, MIPAS ESA reprocessed v6, and SOFIE v1.3 shows overall excellent agreement in the mean profile with the mean difference being within ±10% in most cases. In the stratopause region SABER H_2O tends to be biased high relative to the correlative datasets especially in the SH polar winter where the mean difference reaches 20% or greater. In polar summer above 80km, SABER H_2O is biased low by ~20% compared to the other measurements.

SABER H_2O Error Estimates								
Altitude (km)	15	20	30	40	50	60	70	80
Systematic Error (%)	21	16	13	10	11	13	14	20
Random Error (%)	3	3	2	2	2	3	10	30
Total Error RSS of systematic and random (%)	21	16	13	11	11	14	18	36

Reference: Rong et al. (2019), Validation of water vapor measured by SABER on the TIMED satellite, *J. Atmos. Sol. Terr. Phys*., doi:10.1016/j.jastp.2019.105099.