

SPARC water vapor: Progress towards a merged satellite upper tropospheric and stratospheric humidity data set for studying decadal-scale water vapor changesSean Davis[†]; Karen Rosenlof[†] NOAA ESRL and CIRES, University of Colorado at Boulder, USALeading author: sean.m.davis@noaa.gov

Vertical profiles of humidity from the upper troposphere to stratosphere have been retrieved from several different limb sounding and solar occultation satellite instruments since the 1980's. Instruments retrieving water vapor include the SAGE and POAM instruments, UARS MLS, UARS HALOE, and most recently, ACE-FTS and Aura MLS, among others. Here, we present ongoing work aimed at combining these measurements into a geographically gridded data set that can be used for quantifying variability and long-term changes in water vapor, and can be used for assessing the radiative impact of changes in upper tropospheric and stratospheric humidity. In this presentation, we describe the process of merging the various data sets, which are gridded into a monthly mean product using both geographic and PV-based equivalent latitude in the horizontal, and pressure and isentropic levels in the vertical. Coincident data taken during overlap periods in the satellite record are used to construct bias corrections for each instrument that can be allowed to vary in both the horizontal and vertical. Detailed comparisons will be presented between the satellite retrievals, climatology, and balloon-borne frostpoint hygrometer observations, with the goals of assessing the agreement between the satellite and balloon data, and validating the climatology.