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Satellite stratospheric measurements from the 1990's to now: Data and models

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Measurements of stratospheric species from the Aura satellite's Microwave Limb Sounder (MLS) during the past 4 years are compared to models and results from the earlier (1990s) Upper Atmosphere Research Satellite (UARS) MLS instrument. We focus here on chlorine species measured by Aura MLS (ClO and HCl in particular), along with HNO_3 and H_2O; data from the UARS Halogen Experiment (HALOE) are considered as well. We review some of the spatial, seasonal, interannual, and longer-term changes, along with plans for improved cross-calibration between the different time periods. Some emphasis is given to polar processing issues (extent, timing, and variability of denitrification, dehydration, and chlorine activation); it is well known that temperatures play an important role for such processes. We discuss data/model comparisons, with a focus on the WACCM3 climate chemistry model(CCM), as well as the SLIMCAT chemistry transport model (CTM), which is sampled following the MLS spatial and temporal data coverage.