Measurements of ClO in the Polar Lower Stratosphere from the UARS and EOS Aura Microwave Limb Sounder Experiments

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The Microwave Limb Sounder (MLS) experiments provide vertical profiles of atmospheric composition, temperature, and pressure by measuring millimeter- and submillimeter-wavelength thermal emission from the limb of Earth's atmosphere. The first MLS experiment in space, launched onboard the Upper Atmosphere Research Satellite (UARS) in September 1991, measured the global distribution of several stratospheric species for nearly a decade; however, because the sampling frequency became increasingly irregular in later years, the majority of the measurements were obtained during the unusually cold conditions of the mid-1990s. In this talk we will focus on UARS MLS measurements of ClO, the predominant form of reactive chlorine involved in stratospheric ozone destruction. Daily maps and equivalent latitude/potential temperature cross sections will be used to show interhemispheric and interannual variations in enhanced ClO abundances, and time series of different slices through the data will be examined to develop a comprehensive picture of the mean evolution of active chlorine in the lower stratospheric winter polar vortices. Climatological ClO fields will be derived by averaging together the results for individual years. At the end of the talk, the greatly enhanced capability of the next-generation MLS instrument, to be launched in early 2004 as part of NASA's Earth Observing System (EOS) Aura mission, will be briefly described.