

## Advances in Polar Process and Ozone Loss Studies from EOS MLS

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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 NASA's Upper Atmosphere Research Satellite (UARS) in September 1991, measured the global distribution of several stratospheric species for nearly a decade (albeit with reduced sampling frequency in later years). UARS MLS data have been used in a large number of studies that have extended our understanding of a wide range of polar process topics, including chlorine activation and deactivation, polar stratospheric cloud formation, denitrification and dehydration, vortex descent and confinement, and chemical ozone loss. Although much has been learned from these investigations, many of them have been hampered by a variety of factors, such as large uncertainties and insufficient vertical and/or horizontal resolution in the data, interrupted high-latitude data coverage (because of the UARS yaw maneuvers), and lack of simultaneous, colocated measurements. A second-generation MLS experiment, now being readied for NASA's Earth Observing System (EOS) Aura mission to be launched in early 2004, has capability greatly enhanced over that of UARS MLS. This poster briefly reviews a few representative examples illustrating how UARS MLS data have been used to study polar processes and ozone loss in the past and describes how the anticipated improvements in EOS MLS data (e.g., better spatial and temporal coverage, precision, and vertical range, along with measurement of additional key species such as N<sub>2</sub>O and HCl) should greatly facilitate many polar process investigations and substantially augment our ability to diagnose chemical ozone loss in the Arctic.