

MLS-related Scientific Publication

Scientific Theme: Atmospheric Chemistry

Observations of the 2-Day Wave in UARS MLS Temperature and Ozone Measurements, S. M. I. Azeem, S. E. Palo, D. L. Wu and L. Froidevaux, *Geophys. Res. Lett.*, **28**, 3147–3150, Aug. 2001.

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Summary and MLS contribution

This paper investigates the evolution and structure of 2-day planetary wave perturbations in the temperature and ozone fields at stratospheric and mesospheric altitudes (~ 20 to 80 km) during an active time period from late Dec. 1992 to early Feb. 1993. The recently reprocessed data from the Microwave Limb Sounder (MLS) aboard the Upper Atmosphere Research Satellite (UARS) show that this wave exhibits peak amplitudes (of about 5K for temperature and 0.1 parts per million for ozone) in the upper mesosphere in the summer (southern) hemisphere midlatitudes, with a zonal (longitudinal) wavenumber of three. The amplitude and phase (longitude of maximum amplitude) of the observed mesospheric perturbations are in agreement with photochemical expectations suggesting that ozone at these altitudes responds to temperature variations via (well-known) temperature-dependent reactions.

This work benefits society through its implications for our understanding of ozone and the coupling between dynamics and photochemistry in the upper atmosphere.

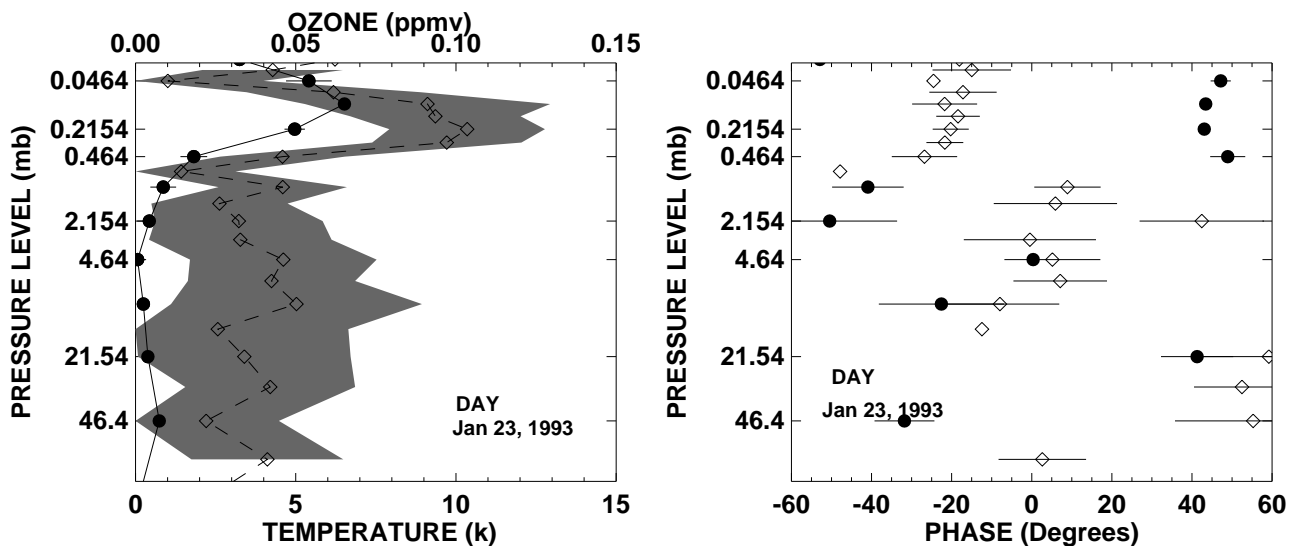


Figure 3. Height profile of the two day wave amplitude (left column) and phase(right column) in ozone and temperature data from UARS MLS measurements for January 23, 1993. Solid circles are for temperature data, diamonds are for ozone data. Shading represents uncertainty in ozone wave amplitudes.