

POLAR MESOSPHERIC SUMMER ECHOES ABOVE ANTARCTICA IN SUMMER 2007/2008

HANS NILSSON (1), Sheila Kirkwood (1), Andrew R. Klekociuk (2), Ray J. Morris (2),
Damian J. Murphy (2)

(1) Swedish Institute of Space Physics, Kiruna, Sweden

(2) Australian Antarctic Division, Kingston, Tasmania, Australia

When PMSE were first observed at Wasa, Antarctica in the austral summer of 2007/2008 they appeared at an unusually high altitude, 3-5 km above the typical altitude. Simultaneous Aura microwave limb sounder temperature estimates showed the mesopause to be approximately 3 km higher than usual. The mesopause was thus located in between the typical winter altitude of 100 km and the typical summer altitude of 88 km. This indicates that the view of just two mesopause levels worldwide need to be somewhat refined. During this early part of the season the southern polar vortex had not broken up yet, and stratospheric eastward winds were about as strong as westward winds in the upper stratosphere. This would lead to strongly limited gravity wave forcing from below of the mesopause region. Interhemisphere coupling may instead provide the dynamics leading to the formation of the early cold summer mesopause for this season. This could be a fairly common situation for the southern hemisphere, whereas similar conditions have so far not been observed in the northern hemisphere. Comparison between PMSE above Wasa and above the Australian Davis station located north of Wasa allows for a study of latitude dependence of the PMSE occurrence, including signatures of planetary wave influence on the PMSE occurrence. Comparison of PMSE strength and occurrence at both Wasa and Davis with Aura MLS temperature and water vapor estimates allows for a study of how much of the PMSE variability is due to the presence of aerosols and how much is due to other limiting factors such as turbulence and ionization. We will show comparisons between the two sites, as well as for different parts of the 2007/2008 season to determine if the early season stands out in more ways than in the altitude distribution.

Polar Mesosphere Summer Echoes

Hans Nilsson, Swedish Institute of Space Physics, Box 812, 981 28 Kiruna, Sweden, tel +4698079127, email hans.nilsson@irf.se