

LIDAR OBSERVATIONS OF THE MESOSPHERIC SODIUM LAYER AT SYOWA STATION, ANTARCTICA (ABSTRACT)

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The mesospheric sodium layer has been measured on 42 nights during the period from April to October 1985 at Syowa Station (69°00'E, 39°35'E), Antarctica, by observation of the resonance scattering of a tuned dye laser beam, which has been made as part of the Middle Atmosphere Program (MAP). There are no pronounced seasonal variations in abundance, the peak height and the width of the sodium layer. No enhancement of abundance in winter has been observed, which is different from those obtained at mid-latitudes in the northern hemisphere. It is, however, interesting to show the oscillatory variation in abundance with a period of about 40 days. The nocturnal variations of sodium profile show wave-like structure with a vertical wavelength of 10 to 16 km and a period of 4 to 8 h, which suggests the existence of gravity wave. During sodium lidar measurements under auroral activity, it has been observed by chance that the layer is disturbed by auroral break-up associated with the change of cosmic noise absorption (CNA).

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NEUTRAL WIND OBSERVATION IN 1985 BY THE SYOWA STATION METEOR RADAR (ABSTRACT)

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Neutral winds at altitudes of 80–100 km were almost continuously observed in 1985 using a 50 MHz meteor radar located at Syowa Station (69.0°S, 39.6°E), Antarctica. The radar has a nominal peak power of 15 kW and narrow antenna beams (about 4° in the horizontal plane) in two directions (approximately geomagnetic and geographic south) with a crossing angle of 33°. It is possible to deduce a two-dimensional wind pattern from wind data obtained by each antenna beam. During an auroral substorm, the radar often detected auroral echoes, in addition to meteor echoes, due to the electron density irregularities in the E-region. By examining carefully