6.10 THE ADELAIDE MF PARTIAL-REFLECTION RADAR AND VHF ST RADAR: A PROGRESS REPORT

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THE MF PARTIAL-REFLECTION RADAR

The MF partial-reflection radar has been running continuously since November 1983, with data being analysed in real time. The spaced antenna technique has been used routinely to produce a climatology of the mean circulation, atmospheric tides and gravity waves. Since the beginning of 1985, the system has also been used as a Doppler radar to measure the spectral widths of the mesospheric echoes. This has enabled the turbulence dissipation rates to be determined by the technique discussed by HOCKING (1983). Also, since January 1985, observations of gravity-wave momentum fluxes, u'w' and v'w' have made for a period of about 4 days each a month with the dual-beam technique described by VINCENT and REID (1982).

THE ST RADAR

The ST radar, which operates at a frequency of 54.1 MHz and is located adjacent to the MF radar, has been used for a number of investigations of the lower atmosphere. In particular, it was operated in the spaced antenna mode to measure winds in November 1984, in conjunction with a large cooperative campaign organized to study the propagation of cold fronts across SE Australia. Observations have also been carried out in collaboration with the Australian Bureau of Meteorology into the structure of the more intense and deeper cold fronts which occur in late winter. The vertical, as well as the horizontal, winds have been studied. There is good agreement between the upward velocities observed prior to the passage of the fronts (up to 0.2 ms^{-1}) and the magnitudes calculated from the convergence of air into the front.

From the start of 1985, Doppler beam-swinging measurements have also been undertaken to measure the upward flux of horizontal momentum. As the beam can be steered only in the EW plane, this restricts the observations to the u'w' fluxes. After testing several pointing angles, a basic angle of 11 has been used.

The radar system is being continually upgraded. Solid-state transmitters are being installed in order to increase the mean power by a factor of about 50. The transmitters are very efficient (60%) and compact. To make full use of the high duty factors available (up to 20%), a complementary phase coding scheme is being implemented.

REFERENCES

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