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N85-32532 D66

8.2A MST RADAR DATA MANAGEMENT

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Wind speed and direction are perhaps the most familiar variable measured with ST radars, and reporting them with the necessary accurracy should continue to be of paramount importance. But reporting only wind speed and direction denys the full capability of ST radars; it would be like reporting only the storm location with a Doppler storm-detection radar. Obviously, recording the full Doppler spectrum and all ancillary radar operating parameters would not be economical for routine operations, and some parsimony must be encouraged. On the other hand, one should not discard valuable data; an example of non-wind-speed data is given next.

One atmospheric variable which can be deduced from ST radar data other than wind speed and direction is C_n^2, related to the eddy dissipation rate. The computation of C_n^2 makes use of the transmitted power (average, or peak plus duty cycle), the range of the echoes, and the returned power (NASTROM et al., 1982). The returned power can be calibrated only if a noise source of known strength is imposed; e.g. in the absence of absolute calibration (GREEN et al., 1983), one can compare the diurnal noise signal with the galactic sky temperature. Thus to compute C_n^2 one needs the transmitter power, the returned signal as a function of height, and the returned noise at an altitude so high that it is not contaminated by any signal. Now C_n^2 relates with the amount of energy within the inertial subrange, and for many research studies it may be desirable to relate this with background flow as well as shears or irregularities on the size of the sample volume. The latter are quantified by the spectral width.

Thus, to avoid weakening the impact of ST radar data, archive recordings should include at least the wind speed and direction, returned signal, noise, and spectral width at each level plus the noise for at least one very high altitude in the neutral atmosphere.

REFERENCES

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