Height

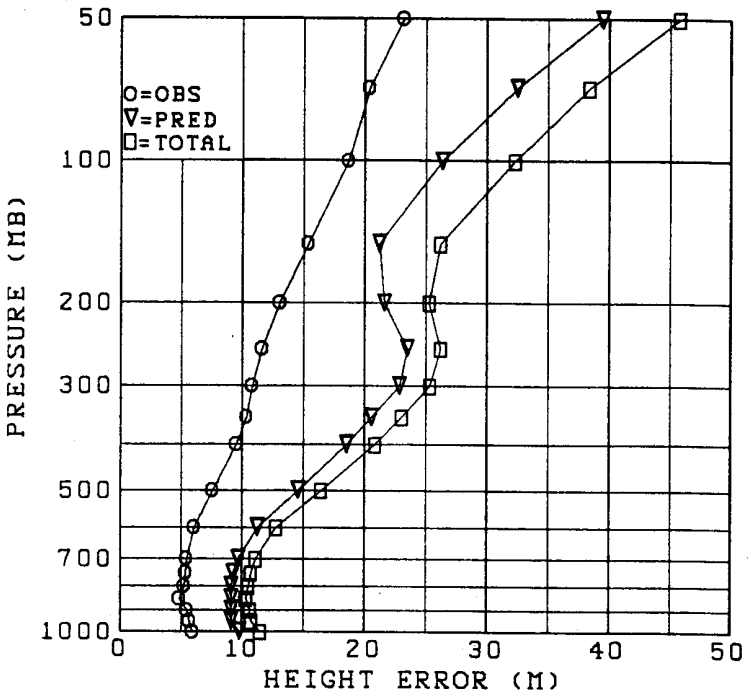

FIG. 8. Vertical profile of the observed height residual (m) (i.e., total perceived forecast error) denoted TOTAL, and the corresponding profiles of prediction and observation error.

Mitchell et al. (1990)

Wind

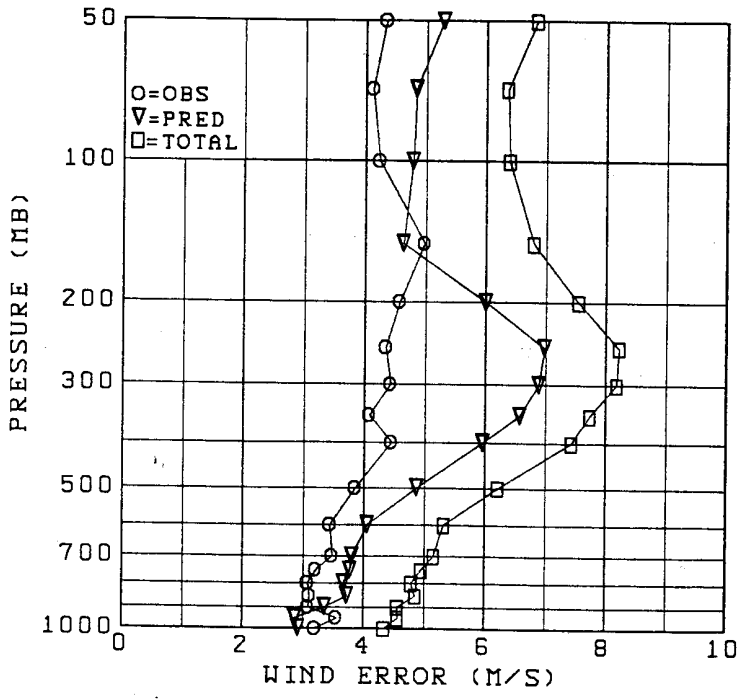

FIG. 5. Vertical profile of the observed wind residual (meters per second) (i.e., total perceived forecast error) denoted TOTAL, and the corresponding profiles of prediction and observation error.

Mitchell et al. (1990)

Homogeneous?

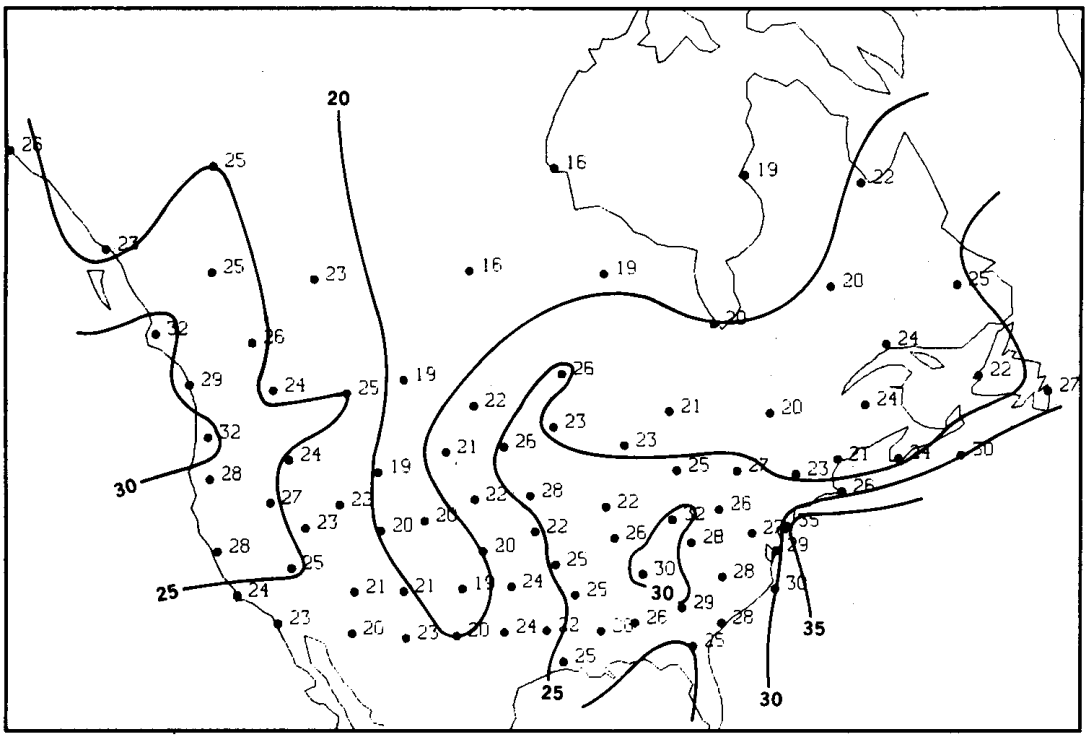

Figure 4.13 The standard deviation of the 250 mb geopotential background (forecast) error over North America (m). (After Lönnberg and Hollingsworth 1986)

Daley (1991)

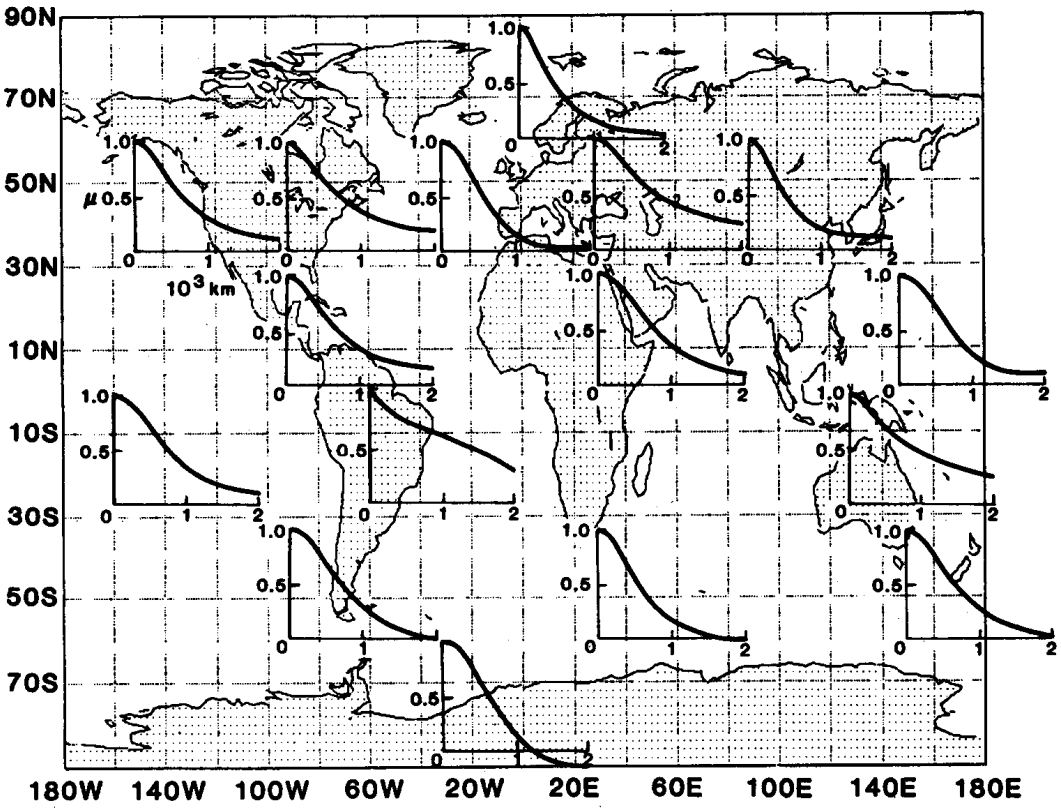

Figure 4.5 Isotropic component of 500 mb geopotential background (forecast) error correlation in different parts of the globe. (After Baker et al. *Mon. Wea. Rev.* **115**: 272, 1987. The American Meteorological Society.)

Daley (1991)

Isotropic?

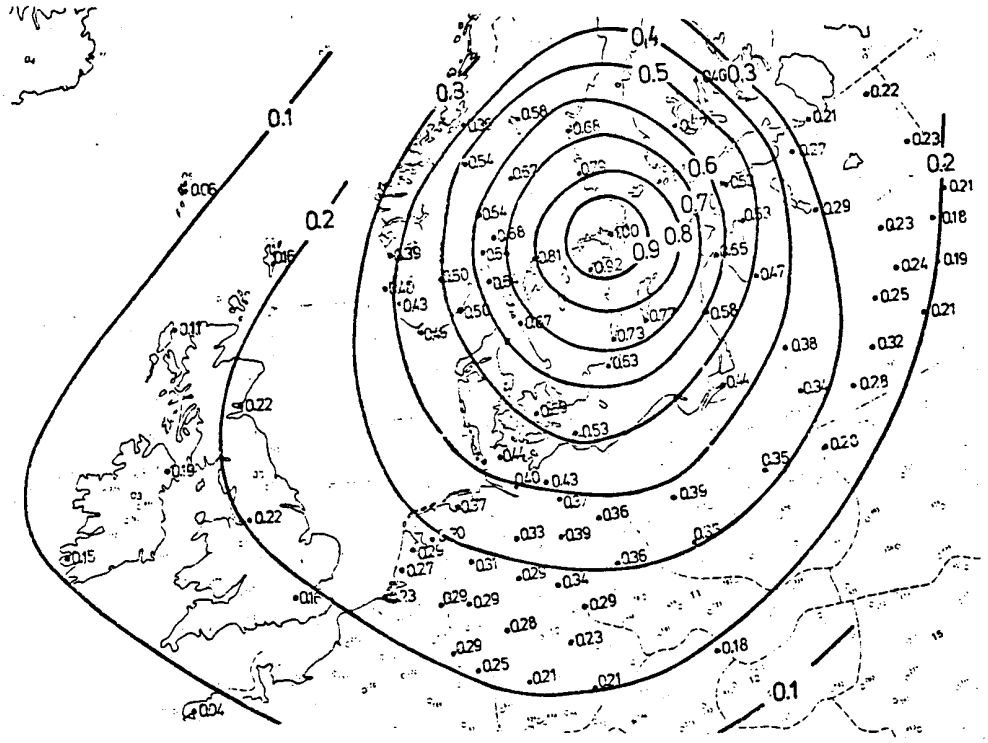

Figure 5.1.1.4.1 Auto-correlation of errors in 12h numerical forecasts of surface pressure in a reference station (Stockholm) and other stations.

Gustafsson (1981)

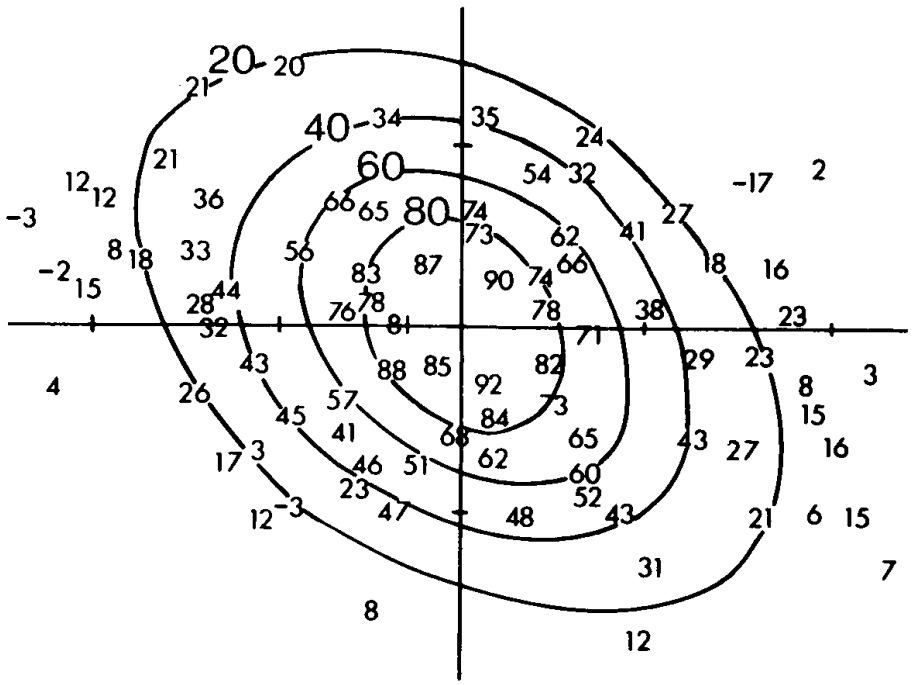

Figure 4.2 Observed-minus-background (climatology) correlation for the 500 mb geopotential field over Australia. All correlations are with respect to the observation station at the origin. (After Seaman, *Aus. Met. Mag.* **30**, 133, 1982. AGPS Canberra, reproduced by permission of Commonwealth of Australia copyright.)

Daley (1991)

Separability of horizontal and vertical correlations

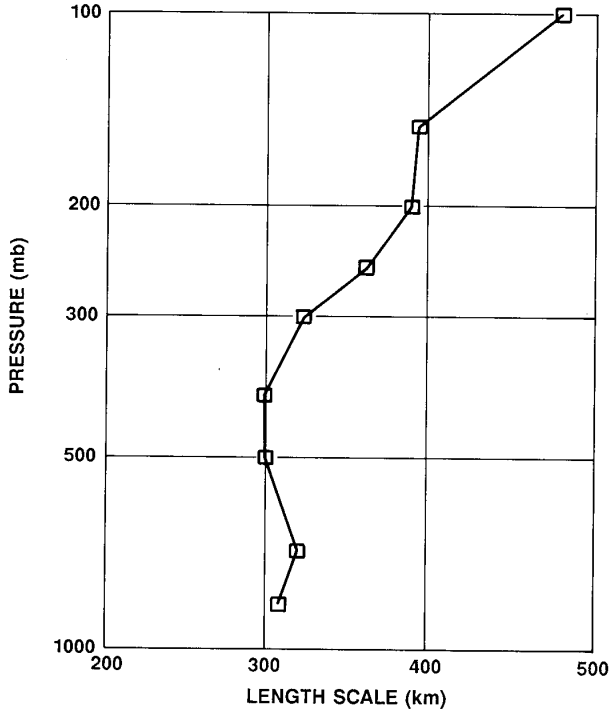

Figure 4.12 The characteristic scale of the geopotential background (forecast) error correlation for the North American radiosonde network as a function of pressure. (After Lönnberg and Hollingsworth 1986)

Daley (1991)

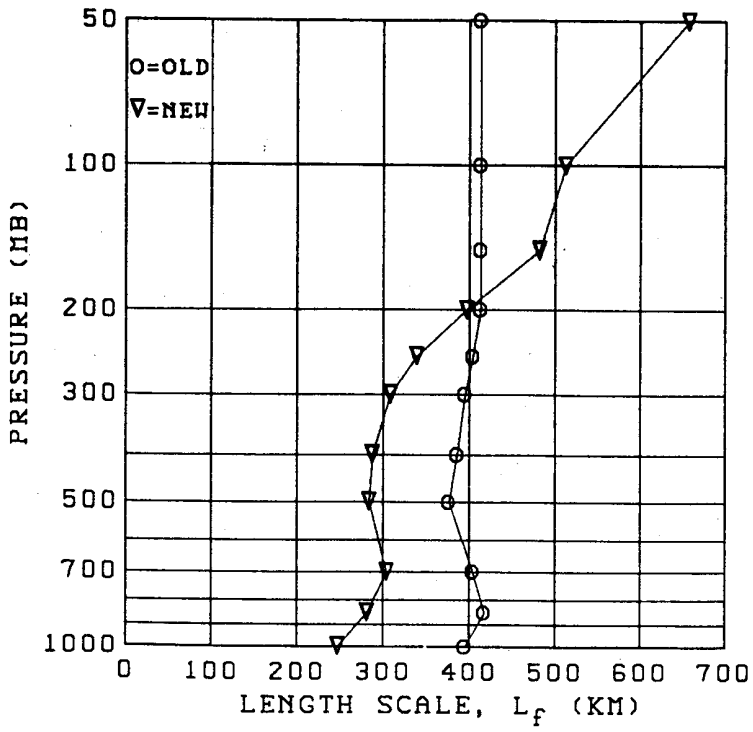

FIG. 18. Vertical profiles of length scale, L_f (km), for both the previously used negative squared exponential function (denoted OLD) and the newly derived correlation function (denoted NEW).

Mitchell et al. (1990)

Vertical correlations

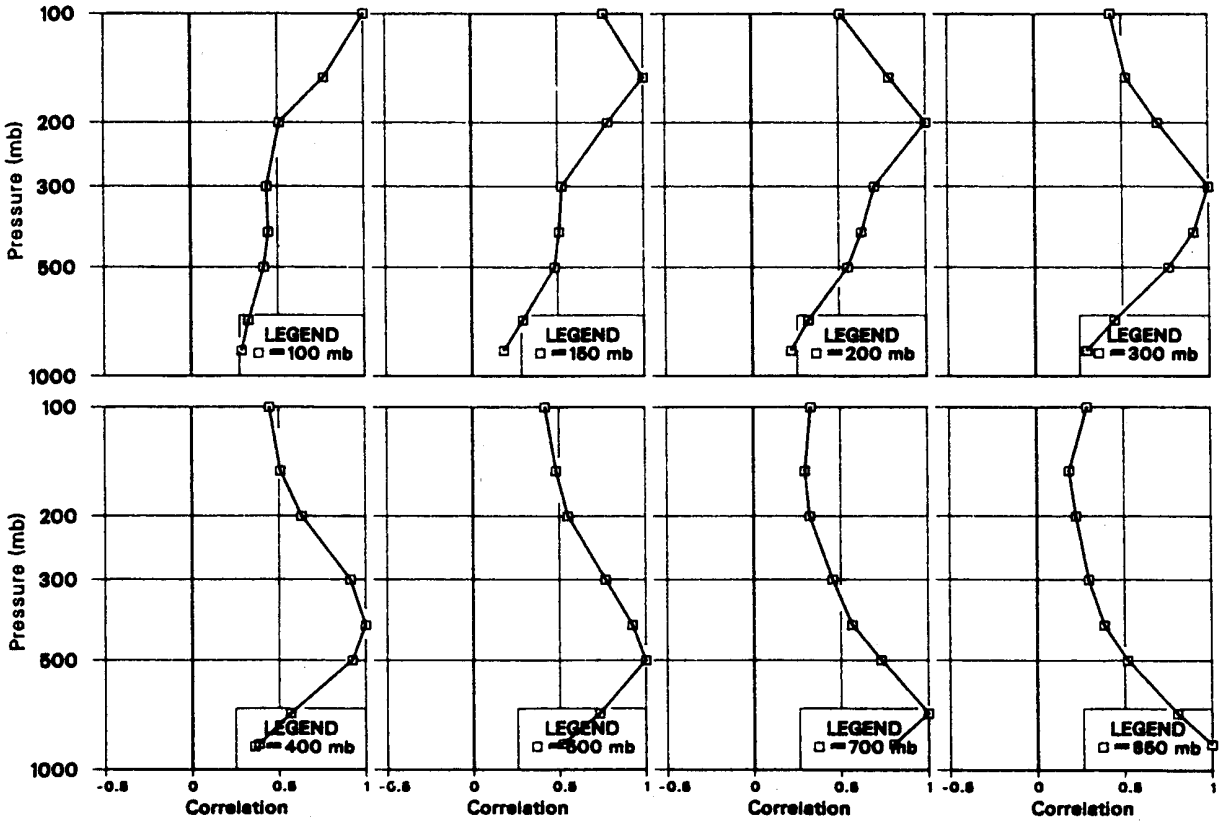

Fig. 10. Height prediction error vertical correlations for a selected set of standard levels, indicated in the legend of each frame of the plot.

Lonnberg and Hollingsworth (1986)

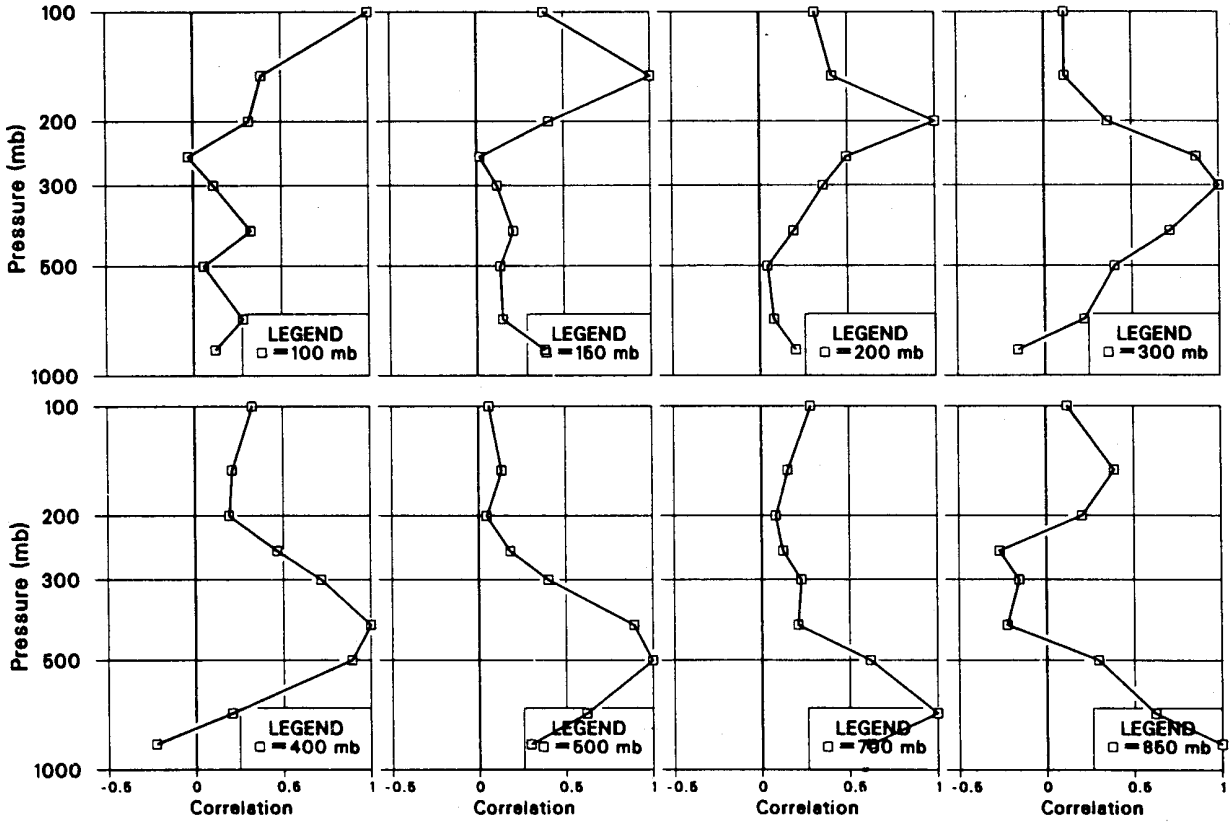

Fig. 16. Non-divergent wind prediction error vertical correlations for a selected set of standard levels, indicated in th legend of each frame of the plot. The plots correspond to particular columns of the vertical correlation matrix fo non-divergent wind.

Hollingsworth and Lonnberg (1986)

Horizontal correlations

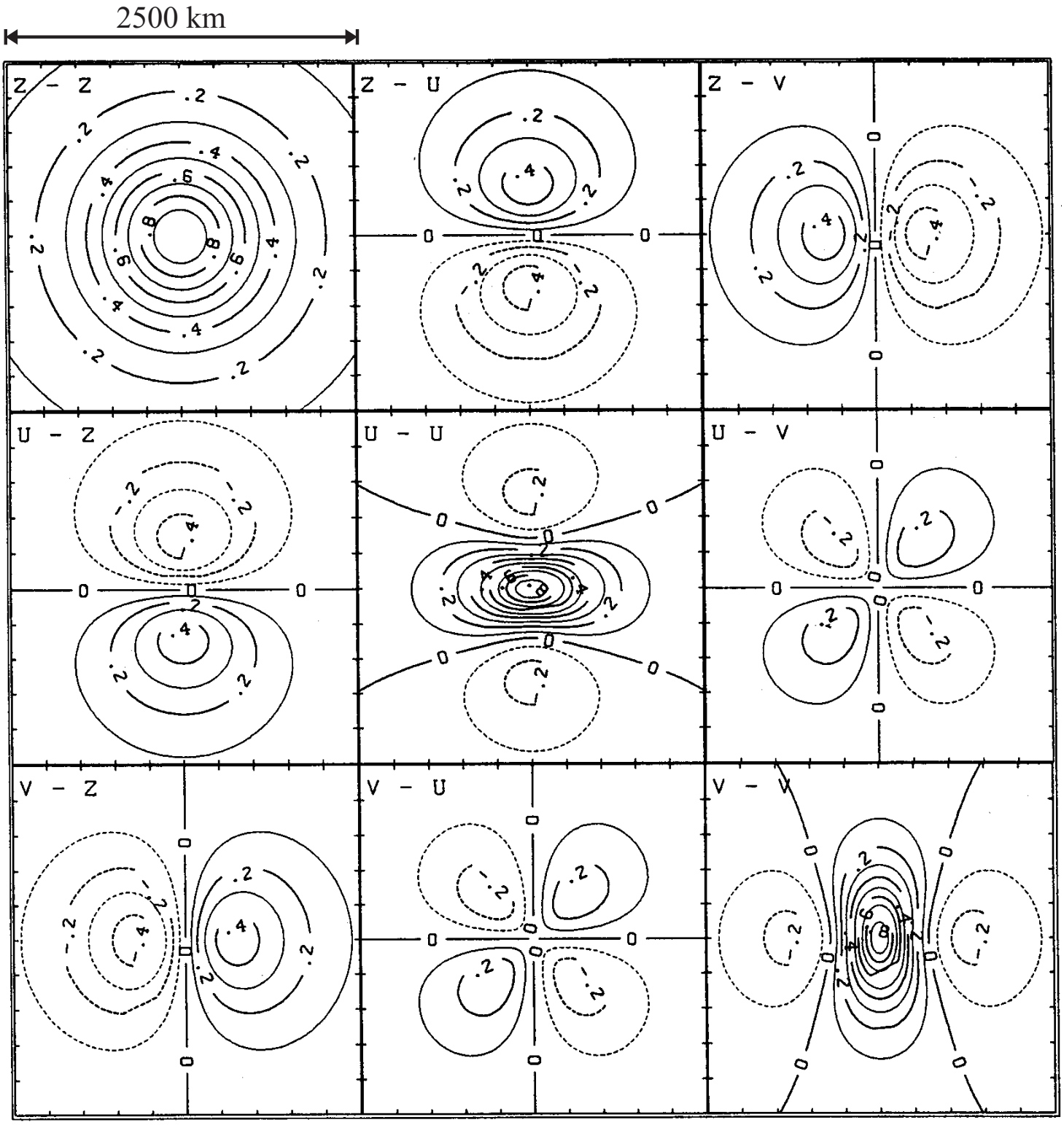

FIG. 17. The complete set of horizontal prediction error correlations for the variables z, u and v based on (7a) with $N = 3$ and $\alpha = 0.2$. The scale parameter, c, is that obtained at 500 mb. Tic marks along margins are 250 km apart.

Mitchell et al. (1990) MWR

Gustafsson (1981)

Table 5.1 Characteristics of operational numerical analysis schemes.

Organization or country	Present operational analysis methods	Analysis area	Analysis forecast cycle	Plans
Australia	. Successive correction method . Variational blending techniques	. S Hemisph . Regional	12 hours 6 hours	
Canada	. Multivariate 3-dimensional statistical interpolation	. N Hemisph . Regional	6 hours (3 hours for the surface)	
France	. Successive correction method, windfield and massfield balance through first guess fields . Multivariate 3-dimensional statistical interpolation	. N Hemisph . Regional	6 hours	
F.R.G.	. Successive correction method. Upper-air analyses are built up, level by level, from the surface . Variational height/wind adjustment	. N Hemisph	12 hours (6 hours for the surface) Climatology only as preliminary fields	Multivariate statistical interpolation is being developed
Japan	. Successive correction method. . Height field analyses are corrected by wind analyses	. N Hemisph . Regional	12 hours	Multivariate statistical interpolation is tested
Sweden	. Uni-variate 3-dimensional statistical interpolation . Variational height/wind adjustment	. N Hemisph . Regional	12 hours 3 hours	A multivariate scheme is being tested
U.K.	. Hemispheric orthogonal polynomial method . Uni-variate statistical interpolation (repeated insertion of data)	. Global	6 hours	Multivariate schemes considered
U.S.A.	. Spectral 3-dimensional analysis . Multivariate 3-dimensional statistical interpolation	. Global . Global	6 hours	
U.S.S.R.	. 2-dimensional statistical interpolation	. N Hemisph	12 hours	
E.C.M.W.F.	. Multivariate 3-dimensional statistical interpolation	. Global	6 hours	