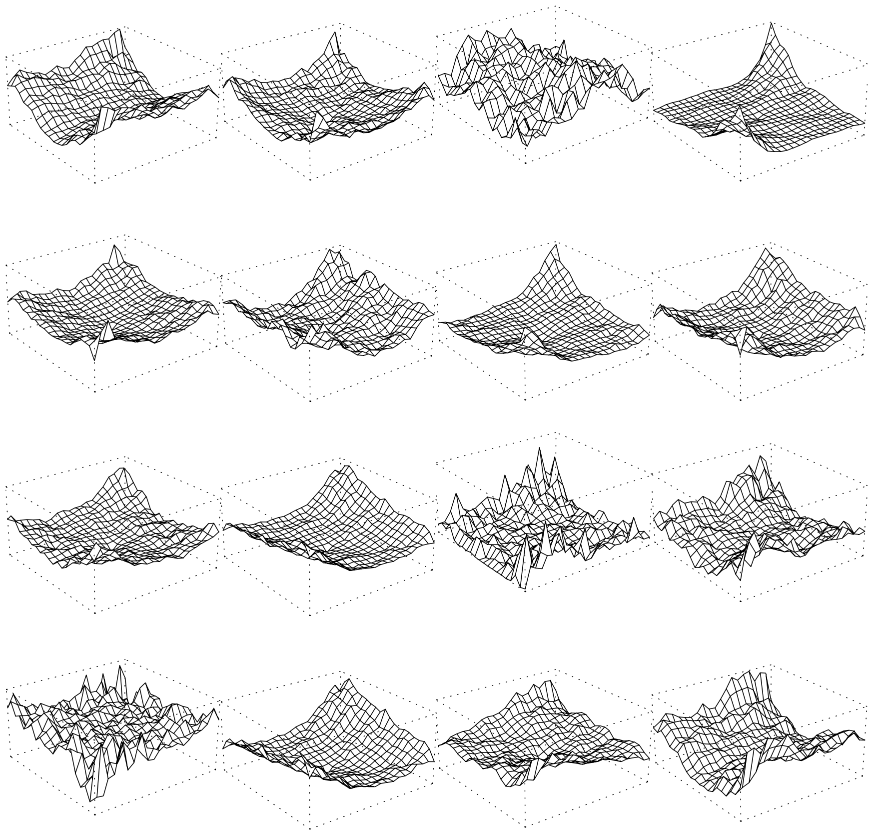

Figure 1.8: 2-D semivariograms for 16 geochemical elements in central Spain, 21×21 1 km pixels as perspective plots





Geologist John Pedersen, Nunaoil, the content of Br in the samples is a question of distances to the sea only. We see that the 2-D semivariogram for Br depicts this fact: high autocorrelation between samples is seen along the coast (cf. Figures 1.15, 1.16, 1.17 or 2.7) where we have low values of the semivariogram.

It is expected that the value of this analysis is similar to that of the above case from central Spain.

### 1.9.2 Kriging versus Cokriging

Another case is kriging and cokriging (with Ta and Eu) of Nb from the above South Greenland study. All three variables are standardized to unit variance here. This case is given in GAF, MAYASA, IMSOR, & DLR (1993) also.

The performances of the two interpolation methods are examined by "leave-one-out" crossvalidation: all data points are estimated by leaving out the point itself and the estimate is then compared with the true value. An undersampled feature is simulated by replacing the data value with a missing value. After the estimation, the mean of the kriging variances (estimated from the kriging system) and the mean of the empirical variances (the mean of the squared differences between the true and the estimated value) are calculated.

The semivariograms and cross-semivariograms are shown in Figure 1.13.

A number of datasets with varying levels of undersampling in Nb are simulated. These datasets are interpolated by kriging and cokriging. The results expressed as the estimation variances and the ratio of the empirical variances of separate kriging and cokriging as functions of the degree of undersampling are shown in Figure 1.14. The neighborhood used in the interpolations are the 12 nearest neighbors.

When the level of undersampling is increased the estimation variance increases, but the increments are greater in the case of separate kriging than cokriging which shows that the cross-correlation between the features is indeed utilized. In the case of 95% undersampling the increment of the empirical cokriging