Filtrage d'une composante

Modèle : $Z(x) = Z_1(x) + Z_2(x) + m$

avec : $E[Z_1(x)] = 0$

$E[Z_2(x)] = 0$

$E[Z_1(x) \,.\, Z_2(x+h)] = 0$

$$C(h) = E[Z(x+h) \,.\, Z(x)] - m^2$$
$$= \dots = E[Z_1(x+h) \,.\, Z_1(x)] + E[Z_2(x+h) \,.\, Z_2(x)]$$
$$= C_1(h) + C_2(h)$$

Extraction d'une composante

$$Z_1^*(0) = \sum_\alpha \lambda_\alpha Z^\alpha$$

- $E[Z_1^*(0)] = \sum_\alpha \lambda_\alpha E[Z^\alpha] = m \,.\, \sum_\alpha \lambda_\alpha$

  $\Rightarrow \sum_\alpha \lambda_\alpha = 0$ condition de non biais

- $$\sigma_E^2 = Var(Z_1^*(0) - Z_1(0))$$
  $$= Var\left(\sum_\alpha \lambda_\alpha Z^\alpha - Z_1(0)\right)$$
  $$= \sum_\alpha \sum_\beta \lambda_\alpha \lambda_\beta C^{\alpha\beta} - 2 \sum_\alpha \lambda_\alpha C_1^\alpha + C_1^0$$

minimum sous contrainte :

$$\phi = \sigma_E^2 + 2\mu \sum_\alpha \lambda_\alpha$$

$$\frac{\partial \phi}{\partial \lambda_\alpha} = 2 \sum_\beta \lambda_\beta C^{\alpha\beta} - 2 C_1^{\alpha 0} + 2\mu = 0 \qquad , \quad \forall \alpha$$

$$\frac{\partial \phi}{\partial \mu} = \sum_\alpha \lambda_\alpha = 0$$

$$\begin{cases} \sum_\beta \lambda_\beta C^{\alpha\beta} + \mu = C_1^{\alpha 0} & , \quad \forall \alpha \\ \sum_\alpha \lambda_\alpha = 0 \end{cases}$$

Analyse krigeante

Filtrage d'une composante

$$Z_f(x) = Z_2(x) + m$$

$$Z_f^*(x) = \sum_\alpha \lambda_\alpha^f Z_\alpha$$

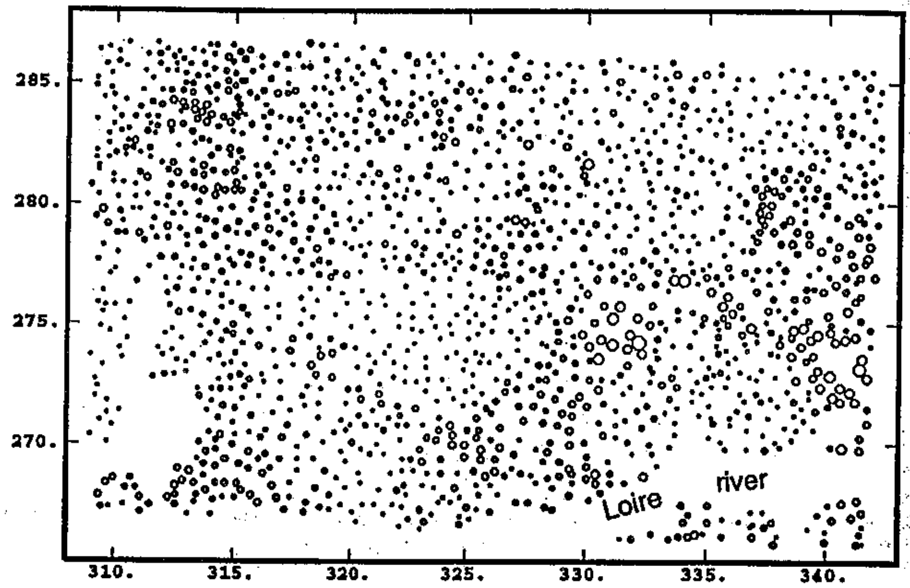
$$\begin{cases} \sum_\beta \lambda_\beta C^{\alpha\beta} + \mu_f = C_2^{\alpha 0} \\ \sum_\alpha \lambda_\alpha = 1 \end{cases}$$

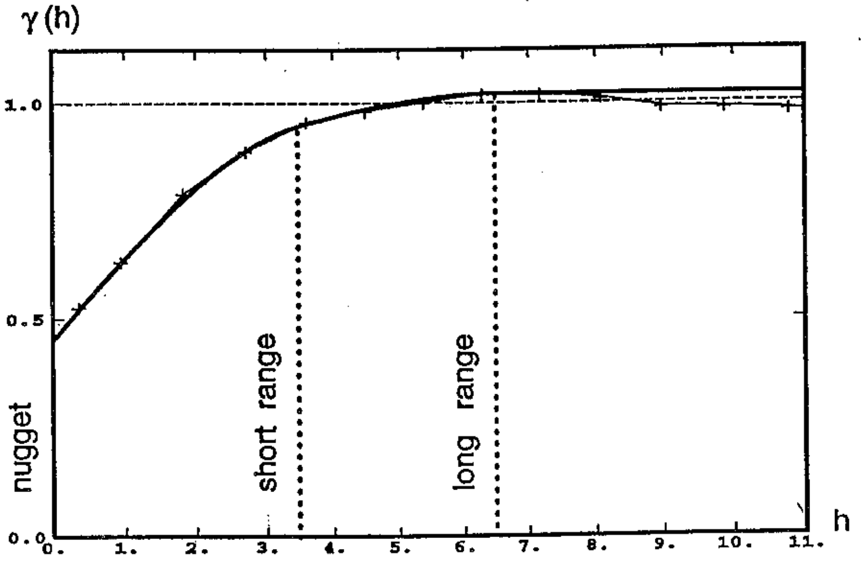
Krigeage filtrant

Additivité du krigeage

$$Z_1^* + Z_f^* = Z^{K0}$$

Analyse Krigeante





Analyse Krigeante

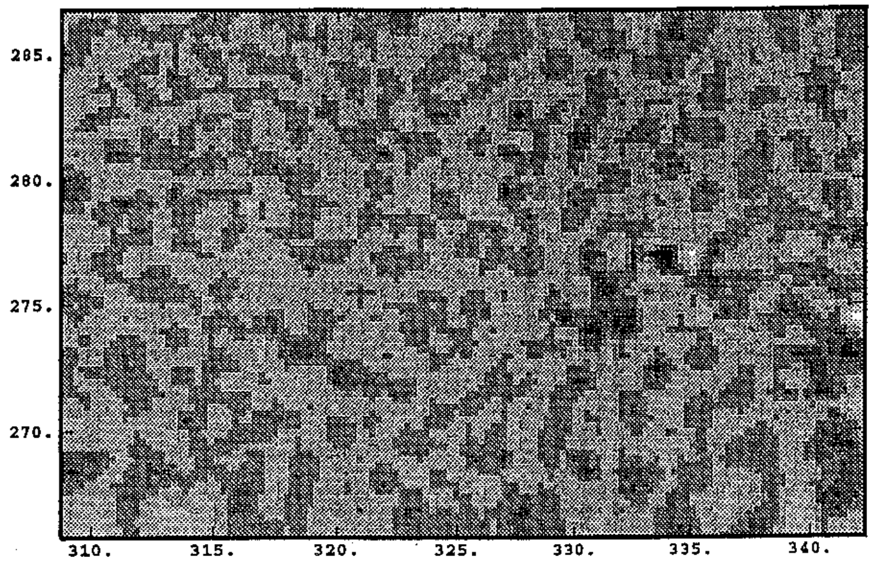


Figure 15.1: Map of the component associated with the short range (3.5 km).

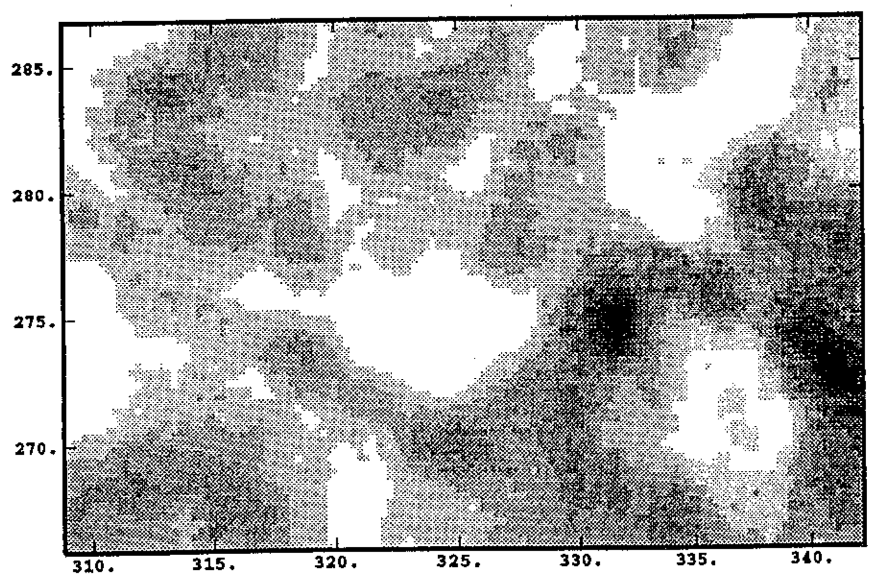


Figure 15.2: Map of the component associated with the long range (6.5 km) together with the estimated mean.