$$\underbrace{X}_{n_i\times d}=\begin{bmatrix} x_1 \\ \vdots \\ x_{n_i} \end{bmatrix}=\begin{bmatrix} x_{(1,1)} & \cdots & x_{(1,d)} \\ \vdots & \ddots & \vdots \\ x_{(n_i,1)} & \cdots & x_{(n_i,d)} \end{bmatrix}$$

$$\underbrace{K^{d_1d_2}\left(\overbrace{X}^{n_1\times d},\overbrace{X'}^{n_2\times d}\right)}_{n_1\times n_2}=K^{d_1d_2}\left(\begin{bmatrix} x_1 \\ \vdots \\ x_{n_1} \end{bmatrix},\begin{bmatrix} x_1{}' \\ \vdots \\ x_{n_2}{}' \end{bmatrix}\right)=\left[k^{d_1d_2}\left(x_i,x_j{}'\right)\right]_{ij}$$

$$K^{d_1d_2}\left(X,X'\right)=X^{d_1d_1}\left(X',X\right)^T$$

$$\left[y^*,y_1^\delta,y_2^\delta,\ldots,y_d{}^\delta,y\middle|\sigma^2,l\right]\sim N\left(0,\Sigma\right)$$

$$\Sigma=\begin{bmatrix} K^{00}\left(X^*,X^*\right) & K^{01}\left(X^*,X_1^\delta\right) & K^{02}\left(X^*,X_2^\delta\right) & \cdots & K^{0d}\left(X^*,X_d^\delta\right) & K^{00}\left(X^*,X\right) \\ K^{10}\left(X_1^\delta,X^*\right) & K^{11}\left(X_1^\delta,X_1^\delta\right) & K^{12}\left(X_1^\delta,X_2^\delta\right) & \cdots & K^{10}\left(X_1^\delta,X_d^\delta\right) & K^{10}\left(X_1^\delta,X\right) \\ K^{20}\left(X_2^\delta,X^*\right) & K^{21}\left(X_2^\delta,X_1^\delta\right) & K^{22}\left(X_2^\delta,X_2^\delta\right) & \cdots & K^{10}\left(X_2^\delta,X_d^\delta\right) & K^{20}\left(X_2^\delta,X\right) \\ \vdots & \vdots & \vdots & \ddots & \vdots & \vdots \\ K^{d0}\left(X_d^\delta,X^*\right) & K^{d1}\left(X_d^\delta,X_1^\delta\right) & K^{d2}\left(X_d^\delta,X_2^\delta\right) & \cdots & K^{dd}\left(X_d^\delta,X_d^\delta\right) & K^{d0}\left(X_d^\delta,X\right) \\ K^{00}\left(X,X^*\right) & K^{01}\left(X,X_1^\delta\right) & K^{02}\left(X,X_2^\delta\right) & \cdots & K^{0d}\left(X,X_d^\delta\right) & K^{00}\left(X,X\right) \end{bmatrix}$$