

$$\begin{array}{c} \mathbf{y}(t) \\ \hline \left[\begin{array}{c} \text{green wave} \\ \vdots \\ \text{blue wave} \end{array} \right] \end{array} = \begin{array}{c} \mathbf{X} \\ \hline \left[\begin{array}{cc} 1 & x_{11}=1 \\ \vdots & \vdots \\ 1 & x_{1N}=0 \end{array} \right] \end{array} \begin{array}{c} \beta(t) \\ \hline \left[\begin{array}{c} \text{black wave } \beta_0(t) \\ \text{red curve } \beta_1(t) \end{array} \right] \end{array} + \begin{array}{c} \boldsymbol{\varepsilon}(t) \\ \hline \left[\begin{array}{c} \text{green wavy line} \\ \vdots \\ \text{blue wave} \end{array} \right] \end{array}$$