

NLS

- ① $E(Y) = f(x, \beta)$
 - ② $E(\varepsilon) = 0$
 - ③ $V(\varepsilon) = \sigma^2 I$
 - ④ $\text{Cov}(\varepsilon, X) = 0$
 - ⑤ $\nabla_{\beta} f(x, \beta)$ of full col. rank
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X non-stoch $\varepsilon \sim N(0, \sigma^2 I)$

$$\text{Min}_{\beta} [Y - f(x, \beta)]' [Y - f(x, \beta)]$$

$$- 2 \{ \nabla_{\beta} f(x, \beta) \}' [Y - f(x, \beta)] = 0$$

$$- 2 \{ \nabla_{\beta} f(x, \beta) \}' Y + 2 \{ \nabla_{\beta} f(x, \beta) \}' f(x, \beta) = 0$$

$$\{ \nabla_{\beta} f(x, \beta) \}' Y = \{ \nabla_{\beta} f(x, \beta) \}' f(x, \beta)$$