

11)

$$X(t) \sim \mathcal{N}(\bar{x}, \sigma_x^2)$$

$$f_x(t) = 4e^{-|t|}$$

stationary \rightarrow

$$\sigma_x^2 = \sigma_{x_1}^2 = \sigma_{x_2}^2$$

$$\bar{x} = \bar{x}_1 = \bar{x}_2$$

$$x_1 = X(t_1)$$

$$x_2 = X(t_1 + 1)$$

$$R_x(1) = 4e^{-1}$$

$$C_{x_1 x_2} = R_x - \bar{x}_1 \bar{x}_2 = R_x - \bar{x}^2$$

$$\rho = \frac{C_{x_1 x_2}}{\sigma_{x_1} \sigma_{x_2}} = \frac{R_x - \bar{x}^2}{\sigma_x^2}$$

$$\rho = \frac{4e^{-1} - \bar{x}^2}{\sigma_x^2}$$

$$f_{x_1, x_2} = \frac{1}{2\pi\sigma_x^2 \sqrt{1-\rho^2}} \exp\left[-\frac{(x_1 - \bar{x})^2 - 2\rho(x_1 - \bar{x})(x_2 - \bar{x}) + (x_2 - \bar{x})^2}{2\sigma_x^2(1-\rho^2)}\right]$$