Control Systems

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Based on
Probability, Random Variables and Random Signal Principles,
P.Z. Peebles,Jr. and B. Shi

Outline

Definition

$$R(\omega) = H_1(\omega)\left[C(\omega) - H_2(\omega)R(\omega)\right]$$

$$R(\omega) = C(\omega)\left[\frac{H_1(\omega)}{1 + H_1(\omega)H_2(\omega)}\right]$$

$$H(\omega) = \frac{R(\omega)}{C(\omega)} = \frac{H_1(\omega)}{1 + H_1(\omega)H_2(\omega)}$$

Definition

$$S_{N_R N_R}(\omega) = S_{N_c N_c}(\omega) \left| \frac{H_1(\omega)}{1 + H_1(\omega) H_2(\omega)} \right|^2$$

Definition

$$Q(\omega) = C(\omega) - F(\omega)$$

$$= C(\omega) - H_2(\omega)H_1(\omega)Q(\omega)$$

$$Q(\omega) = \frac{C(\omega)}{1 + H_1(\omega)H_2(\omega)}$$

Definition

$$H_{opt}(\omega) = \frac{e^{j\omega t_0}}{1 + [S_{NN}(\omega)/S_{XX}(\omega)]}$$

$$H(\omega) = H_{opt}(\omega)$$

$$H_1(\omega) = e^{j\omega t_0}$$

$$H_2(\omega) = [S_{NN}(\omega)/S_{XX}(\omega)]\, e^{-j\omega t_0}$$