$$\vec{x}(t)=\sum_{k=1}^{2} c_k \vec{u}_k e^{-i\lambda_k t} \Rightarrow \begin{bmatrix} A_1(t) \\ A_2(t) \end{bmatrix} = c_1\vec{u}_1 e^{-i\lambda_1 t} + c_2 \vec{u}_2 e^{-i\lambda_2 t}$$

Π.Χ

$$\begin{bmatrix} A_1(t) \\ A_2(t) \end{bmatrix} = \begin{bmatrix} c_1 u_{11} e^{-i\lambda_1 t} + c_2 u_{12} e^{-i\lambda_2 t} \\ c_1 u_{21} e^{-i\lambda_1 t} + c_2 u_{22} e^{-i\lambda_2 t} \end{bmatrix}$$

$$|A_1(t)|^2 = \left(c_1 u_{11} e^{-i\lambda_1 t} + c_2 u_{12} e^{-i\lambda_2 t}\right)\left(c_1^* u_{11}^* e^{i\lambda_1 t} + c_2^* u_{12}^* e^{i\lambda_2 t}\right)$$

$$|A_1(t)|^2 = |c_1|^2 \cdot |u_{11}|^2 + c_1 u_{11} c_2^* u_{12}^* e^{i(\lambda_2-\lambda_1)t} + c_2 u_{12} c_1^* u_{11}^* e^{i(\lambda_1-\lambda_2)t} + |c_2|^2 |u_{12}|^2$$

Αν $c_k, \vec{u}_k$ είναι πραγματικά

$$e^{ix}+e^{-ix} = \begin{matrix} \cos x + i\sin x \\ \cos x - i \sin x \end{matrix} = 2\cos x$$

$$|A_1(t)|^2 = \underline{c_1^2 u_{11}^2 + c_2^2 u_{12}^2} + 2 c_1 u_{11} c_2 u_{12} \cos[(\lambda_2-\lambda_1)t]$$

$$\omega = \lambda_2 - \lambda_1$$

$$|A_1(t)|^2 = c_1^2 u_{11}^2 + c_2^2 u_{12}^2 + 2 c_1 u_{11} c_2 u_{12} \cos\omega t$$

$$\frac{2\pi}{T} = \lambda_2 - \lambda_1$$

$$1 = \underline{c_1^2 u_{11}^2 + c_2^2 u_{12}^2} + 2 c_1 u_{11} c_2 u_{12} \quad \text{Α.Σ.}$$

$$T = \frac{2\pi}{\lambda_2-\lambda_1}$$

$$|A_1(t)|^2 = 1 - 2 c_1 u_{11} c_2 u_{12} + 2 c_1 u_{11} c_2 u_{12} \cos\omega t$$

$$|A_1(t)|^2 = 1 + 2 c_1 u_{11} c_2 u_{12} (\cos\omega t - 1)$$

$$-1 \le \cos\omega t \le 1$$

$$-2 \le \cos\omega t - 1 \le 0$$

$$-4 c_1 u_{11} c_2 u_{12} \le 2 c_1 u_{11} c_2 u_{12} (\cos\omega t - 1) \le 0$$

$$1 - 4 c_1 u_{11} c_2 u_{12} \le 1 + 2 c_1 u_{11} c_2 u_{12} (\cos\omega t - 1) \le 1$$

$$1 - 4 c_1 u_{11} c_2 u_{12} \le |A_1(t)|^2 \le 1$$

$$\Rightarrow p = \text{maximum transfer percentage} = 4 c_1 u_{11} c_2 u_{12}$$