$n = 2$ CASE, EXAMPLE

6 14

$$\underline{\underline{U}}_G = \begin{bmatrix} U_1^{(1)} & U_1^{(2)} \\ U_2^{(1)} & U_2^{(2)} \end{bmatrix} \qquad \mathrm{Det} = U_1^{(1)} U_2^{(2)} - U_2^{(1)} U_1^{(2)}$$

└ RANDOM

$$\underline{\underline{U}}_G \underline{\underline{U}}_G^* = \begin{bmatrix} |U_1^1|^2 + |U_1^2|^2 & U_1^1 \overline{U_2^1} + U_1^2 \overline{U_2^2} \\ U_2^1 \overline{U_1^1} + U_2^2 \overline{U_1^2} & |U_2^1|^2 + |U_2^2|^2 \end{bmatrix}$$

$$\mathrm{Det} = \text{RANDOM}$$

LINEAR MIMO SOLUTION $\underline{\underline{U}}_H = U_{SISO} \cdot \underline{\underline{T}}_H$ HADAMARD

NOT ENOUGH INDEPENDENCE $\underline{\underline{U}}_H = U(1) \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}$

$$\underline{\underline{G}}_{BLA}\Big|_{\underline{\underline{U}}_G} \neq \underline{\underline{G}}_{BLA}\Big|_{\underline{\underline{U}}_H}$$

(GENERAL)

<u>OPTIMAL (BLA-INVARIANT) SOLUTION</u>

$$\underline{\underline{U}}_{ORT} = \begin{bmatrix} U_1(1) & 0 \\ 0 & U_2(1) \end{bmatrix} \cdot \begin{bmatrix} \text{ORTHONORMAL} \\ \text{MATRIX} \end{bmatrix} \rightarrow$$

$$\rightarrow \begin{bmatrix} U_1^{(1)} & U_1^{(2)} \\ U_2^{(1)} & U_2^{(2)} \end{bmatrix} = \begin{bmatrix} U_1(1) & U_1(1) \\ U_2^{(1)} & -U_2(1) \end{bmatrix}$$

$$\underline{\underline{G}}_{BLA}\Big|_{\underline{\underline{U}}_G} = \underline{\underline{G}}_{BLA}\Big|_{\underline{\underline{U}}_{ORTO}}$$

$$\underline{\underline{U}}_{ORTO} \underline{\underline{U}}_{ORT}^* \rightarrow \begin{bmatrix} U_1 & U_1 \\ U_2 & -U_2 \end{bmatrix} \begin{bmatrix} \overline{U}_1 & \overline{U}_2 \\ \overline{U}_1 & -\overline{U}_2 \end{bmatrix} = \begin{bmatrix} 2|U_1|^2 & \phi \\ \phi & 2|U_2|^2 \end{bmatrix}$$

- DETERMINISTIC
- NO OFF DIAGONAL (DISTORTIONS)