

- NOISE PARAMETRIC MODEL - NON IDENTIFIABLE

$$C_r, d_r \leftrightarrow \sum_{i=1}^n \lambda_i C_r, \lambda_i d_r \quad \lambda_1, \lambda_2 \neq 0$$

MODEL UNCHANGED

MONIC POLYNOMIALS NEEDED $d_0 = C_0 = 1$

ARBITRARY SIGNALS (G, T_G)

- PFE: IDENTIFIABLE

- RF: SAME PROBLEM (NOT) $G(\lambda, \theta) = G(\lambda, \lambda\theta)$
 $T_G(\lambda, \theta) = T_G(\lambda, \lambda\theta)$

- S-S: $(A, B, C, D) \leftrightarrow (TAT^{-1}, \dots)$
 (NOT) $G(\lambda, \theta), T_G(\lambda, \theta)$ UNCHANGED

TH1 (PERIODIC SIGNALS)

TF MODEL B/A ($a_{n_a} = 1$) IN $y = G \cdot u$ EQUATION IS IDENTIFIABLE, IF AND ONLY IF:

- 1) $A(\lambda, \theta), B(\lambda, \theta)$ HAVE NO COMMON ROOTS
- 2) $U(k) \neq \emptyset$ FOR AT LEAST $(n_a + n_b + 1)/2$ DIFFERENT DFT FREQUENCIES
 $\left. \begin{array}{l} \text{DC } k=0 \\ \text{Nyquist } k=M/2 \end{array} \right\} 1/2, 1/2 \text{ FREQUENCY}$

TH2 (ARBITRARY SIGNALS)

FOR $y = G \cdot u + T_G + \delta$ TO BE IDENTIFIABLE, IT IS NECESSARY

- 1) $A(\lambda, \theta), B(\lambda, \theta), I(\lambda, \theta)$ HAVE NO COMMON ROOTS
- 2) $U(k) \neq \emptyset$ AT LEAST AT $(n_b + n_c + 2)/2$ DIFFERENT DFT FREQUENCIES
 (DC + NYQUIST = 1 FREQ)
- 3) $U(k)$ CANNOT BE WRITTEN AS A RATIONAL FUNK OF λ_k OF ORDER $\frac{n_c}{n_b}$ OR LESS
 (IF NOT FULLFILLED: $G(\lambda_k, \theta)U(k)$ AND $T_G(\lambda_k, \theta)$ ARE NOT INDISTINGUISHABLE)