(2) LOCAL POLYNOMIAL METHOD – LPM

$$Y(k) = G(k)U(k) + T(k) + V(k)$$

$R = 2$ SUGGESTED

$$G(k+r) = G(k) + \sum_{s=1}^{R} g_s(k) r^s \quad O\left(\left(\frac{r}{N}\right)^{(R+1)}\right)$$

$$T(k+r) = T(k) + \sum_{s=1}^{R} t_s(k) r^s \quad N^{-1/2}\, O(\cdots)$$

$$Y(k+r) = \left(G(k) + \sum_{s=1}^{R} g_s(k) r^s\right) U(k+r) + \left(T(k) + \sum_{s=1}^{R} t_s(k) r^s\right) + V(k+r)$$

$r = -n, -n+1, \ldots -1, 0, 1, \ldots n-1, n$

$[-n, n]$

LOCAL WINDOW

$$= \Theta\, K(k+r) + V(k+r)$$

$$\Theta = \underbrace{[G(k)\ g_1(k) \cdots g_R(k)\ T(k)\ t_1(k) \cdots t_R(k)]}_{2(R+1)}$$

$$K(k+r) = \begin{bmatrix} K_1(r) \otimes U(k+r) \\ K_1(r) \end{bmatrix}$$

$$\overset{Y}{\square} = \overset{\Theta}{[\quad]}\ \overset{K}{[\ ]} + \overset{V}{\square}$$

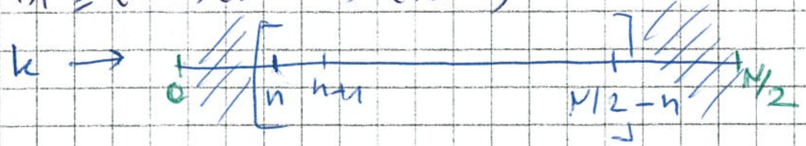
$$K_1(r) = \begin{bmatrix} 1 \\ r \\ \vdots \\ r^R \end{bmatrix}$$

$r \in [-n, n]$

$$\underbrace{[Y(k-n)\ Y(k-n+1) \cdots Y(k+n)]}_{Y_n} = [\Theta] \underbrace{\begin{bmatrix} K(k-n) & K(k-n+1) & \cdots & K(k+n) \end{bmatrix}}_{K_n} + [\ ]$$

FULL RANK K_n

- $2n+1 \geq 2(R+1)$ ~~...~~ (SISO)
- $2n+1 \geq (R+1)(n_u+1)$ (MISO)



FROM SOLUTION NEEDED ONLY $G(k)$!