UNCORRELATED MEASUREMENTS $U(k)$ $Y(k)$

$$V_F(\theta, z) = \frac{1}{F} \sum_{k}^{F} \left[\frac{|U(k) - U_p(k)|^2}{\sigma_U^2(k)} + \frac{|Y(k) - Y_p(k)|^2}{\sigma_Y^2(k)} \right]$$

+

$$Y_p(k) = G(\Lambda_k, \theta)\, U_p(k) \quad \text{(CONSTRAINT XF)}$$

MIN: θ, U_p, Y_p → LAGRANGE - MULTIPLIERS

$$V_F(\theta, z) = \frac{1}{F} \sum_{k} \begin{pmatrix} Y(k) - Y_p(k) \\ U(k) - U_p(k) \end{pmatrix}^* \begin{bmatrix} \sigma_Y^2(k) & 0 \\ 0 & \sigma_U^2(k) \end{bmatrix}^{-1} \begin{pmatrix} Y(k) - Y_p(k) \\ U(k) - U_p(k) \end{pmatrix}$$

CORRELATED NOISES $\sigma_{YU}^2(k) \neq \phi$

$$V_F(\theta, z) = \frac{1}{F} \sum_{k=1}^{F} \begin{pmatrix} Y(k) - Y_p(k) \\ U(k) - U_p(k) \end{pmatrix}^* \begin{bmatrix} \sigma_Y^2(k) & \sigma_{YU}^2(k) \\ \sigma_{UY}^2(k) & \sigma_U^2(k) \end{bmatrix}^{-1} \begin{pmatrix} Y(k) - Y_p(k) \\ U(k) - U_p(k) \end{pmatrix}$$

$$+ \quad Y_p(k) = G(\Lambda_k, \theta)\, U_p(k) \qquad k = 1, 2, \cdots, F$$

MIN: $\theta, U_p(k), Y_p(k)$ $\quad k = 1, 2, \cdots F$

LARGE F, MIN FOR ALL ?

SIMPLIFICATION : $Y_p(k), U_p(k)$ ELIMINATION

$$V_F(\theta, z) = \frac{1}{F} \sum \frac{|Y(k) - G(\Lambda_k, \theta)\, U(k)|^2}{\sigma_Y^2(k) + \sigma_U^2(k)\,|G(\Lambda_k, \theta)|^2 - 2\,\mathrm{Re}\left(\sigma_{YU}^2(k)\, \overline{G}(\Lambda_k, \theta)\right)}$$

- ROBUST TO BAD MEASUREMENTS
- NO DIVISION
- MEASUREMENT METHOD NOT IMPORTANT

↑ LS SEE EARLIER

- SYMMETRY : $G(\Lambda_k, \theta) = B(\Lambda_k, \theta) / A(\Lambda_k, \theta)$ | $\times |A(\Lambda_k, \theta)|^2$