

$$\begin{bmatrix} x_{k+1} \\ z_{k+1} \\ s_{k+1} \end{bmatrix} = \begin{bmatrix} \mathbf{A} & 0 & 0 \\ \mathbf{FC} & \mathbf{E} & 0 \\ 0 & \mathbf{IG} & \mathbf{H} \end{bmatrix} \begin{bmatrix} x_k \\ z_k \\ s_k \end{bmatrix} + \begin{bmatrix} \mathbf{B} \\ 0 \\ 0 \end{bmatrix} u_k$$

$$w_k = \mathbf{J}z_k.$$