

$$\begin{array}{c}
\begin{array}{ccc}
& n \times 2k & 2k \times 2k & 2k \times n \\
= \begin{bmatrix} A_{11} & 0 \\ 0 & A_{22} \end{bmatrix} + \begin{bmatrix} U_1 & 0 \\ \hline 0 & U_2 \end{bmatrix} \begin{bmatrix} 0 & \tilde{A}_{12} \\ \tilde{A}_{21} & 0 \end{bmatrix} \begin{bmatrix} V_1^T & 0 \\ \hline 0 & V_2^T \end{bmatrix}
\end{array}
\end{array}$$