$$\theta = \sum_{1}^{M} \omega_m \Delta F_m^2 + \sum_{1}^{H} \lambda_h G_h$$

$$\mathbf{U} = \left[\Delta u_1 \cdots\cdots \Delta u_N\right] \qquad \mathbf{L} = \left[2\lambda_1 \cdots 2\lambda_H\right]$$

$$\mathbf{G} = \left[-G_1 \cdots -G_H\right] \qquad \mathbf{D} = \left[\sqrt{\omega_1}\Delta F_1 \cdots \sqrt{\omega_M}\Delta F_M\right]$$

$$\mathbf{N} = \begin{bmatrix} \frac{\partial G_1}{\partial U_1} & \cdots & \frac{\partial G_H}{\partial U_1} \\ \vdots & & \vdots \\ \frac{\partial G_1}{\partial U_N} & \cdots & \frac{\partial G_H}{\partial U_N} \end{bmatrix} \qquad \mathbf{P} = \begin{bmatrix} \sqrt{\omega_1}\frac{\partial F_1}{\partial U_1} & \cdots & \sqrt{\omega_1}\frac{\partial F_1}{\partial U_N} \\ \vdots & & \vdots \\ \sqrt{\omega_M}\frac{\partial F_M}{\partial U_1} & \cdots & \sqrt{\omega_M}\frac{\partial F_M}{\partial U_N} \end{bmatrix}$$

$$\left[\mathbf{U} \,\middle|\, \mathbf{L}\right] = \left[\mathbf{DP} \,\middle|\, \tfrac{1}{2}\mathbf{G}\right] \left[\begin{array}{c|c} \mathbf{P^TP} & \tfrac{1}{2}\mathbf{N} \\ \hline \tfrac{1}{2}\mathbf{N^T} & \mathbf{0} \end{array}\right]^{-1}$$