$$\mathbf{r}_{0} = \mathbf{b} - \mathbf{A}\mathbf{x}_{0}$$

$$\mathbf{Z}_{0} = \left(\sum_{s=1}^{N} \mathbf{H}^{(s)}\right)\mathbf{r}_{0}$$

$$\mathbf{P}_{0} = \mathbf{\Pi}\mathbf{Z}_{0}$$
While not converged
$$\mathbf{Q}_{i} = \mathbf{A}\mathbf{P}_{i}$$

$$\mathbf{\Delta}_{i} = \mathbf{Q}_{i}^{T}\mathbf{P}_{i}, \ \boldsymbol{\gamma}_{i} = \mathbf{P}_{i}^{T}\mathbf{r}_{i}, \ \boldsymbol{\alpha}_{i} = \mathbf{\Delta}_{i}^{+}\boldsymbol{\gamma}_{i}$$

$$\mathbf{x}_{i+1} = \mathbf{x}_{i} + \mathbf{P}_{i}\boldsymbol{\alpha}_{i}$$

$$\mathbf{r}_{i+1} = \mathbf{r}_{i} - \mathbf{Q}_{i}\boldsymbol{\alpha}_{i}$$

$$\mathbf{Z}_{i+1} = [\mathbf{H}^{1}\mathbf{r}_{i+1}|...|\mathbf{H}^{N}\mathbf{r}_{i+1}]$$
For $j = 1, ..., i$

 $oldsymbol{eta}_{i,j} = rac{\langle \mathbf{z}_{i+1}, \mathbf{A} \mathbf{p}_j
angle}{\langle \mathbf{p}_i, \mathbf{A} \mathbf{p}_i
angle}$

 $\overline{\mathsf{P}_{i+1} = \mathsf{\Pi}\mathsf{Z}_{i+1} - \mathsf{P}_{i}oldsymbol{eta}_{i,i}}$

 $\mathbf{x}_0 = \Pi \mathbf{x}_{00} + \mathbf{U} (\mathbf{U}^T \mathbf{A} \mathbf{U})^{\dagger} \mathbf{U}^T \mathbf{b}$