

noch z_2

$$r_j^H = r_m = 0 \text{ und } P_{j+1}^H A P_{m+1} \text{ f\u00fcr } 0 \leq j < m, m \geq 1$$

IV F\u00fcr $0 \leq j < l \leq m-1$ gilt $r_j^H r_l = 0$, $P_{j+1}^H A P_{l+1} = 0$

[$j = m-1$ siehe oben]

IS $j < m-1$ $m-1 \sim m$

$$\begin{aligned} r_j^H r_m &= r_j^H (r_{m-1} - \tau_m A P_m) = \overbrace{r_j^H r_{m-1}}^{=0} - \tau_m r_j^H A P_m \\ &= -\tau_m (P_{j+1} - \mu'_{j+1} P_j)^H A P_m \stackrel{IV}{=} 0 \end{aligned}$$

$$\begin{aligned} P_j^H A P_{m+1} &= P_j^H A (r_m + \mu'_{m+1} P_m) = P_j^H A r_m + \mu'_{m+1} \underbrace{P_j^H A P_m}_{=0} \\ &= \frac{1}{\tau_j} (r_{j+1} - r_j)^H r_m = 0 \end{aligned}$$