Rearranging in tridiagonal matrix form we get

FC_{K-1} BC FC_K

$$-\left[\frac{\lambda \Delta t\, K_{M_{K-1}}}{\Delta s^2\, H^{n+1}_{\theta_{K-1}}}\right] U^{n+1}_{K-1} + \left[H^{n+1}_{\theta_K} + \frac{\lambda \Delta t\, K_{M_K}}{\Delta s^2\, H^{n+1}_{\theta_K}} + \frac{\lambda \Delta t\, K_{M_{K-1}}}{\Delta s^2\, H^{n+1}_{\theta_{K-1}}}\right] U^{n+1}_K - \left[\frac{\lambda \Delta t\, K_{M_K}}{\Delta s^2\, H^{n+1}_{\theta_K}}\right] U^{n+1}_{K+1} =$$

A B C

$$\left[H^n_\theta u^n + \Delta t\, mn\, R_u + \frac{\Delta t(1-\lambda)}{\Delta s^2}\left(\frac{K_{M_K}}{H^n_{\theta K}}\left(u^n_{K+1} - u^n_K\right) - \frac{K_{M_{K-1}}}{H^n_{\theta K-1}}\left(u^n_K - u^n_{K-1}\right)\right)\right]$$

D FC_{K+1} FC_{K-1}

Bottom ($K=1$) and top ($K=N$) values for tridiagonal coefficients A, B, C, D

$$A(1) = 0$$

$$A(2{:}N) = -\frac{\lambda \Delta t\, K_{M_{K-1}}}{\Delta s^2\, H^{n+1}_{\theta_{K-1}}} \qquad \$\ \frac{m^2}{s}\frac{1}{m^2} : m$$

$$B(1) = H^{n+1}_{\theta_1} + \frac{\lambda \Delta t\, K_{M_1}}{\Delta s^2\, H^{n+1}_{\theta_1}} \qquad m + \$\ \frac{m^2}{s}\frac{1}{m^2} : m$$

$$B(2{:}Nm) = H^{n+1}_{\theta_K} + \frac{\lambda \Delta t\, K_{M_K}}{\Delta s^2\, H^{n+1}_{\theta_K}} + \frac{\lambda \Delta t\, K_{M_{K-1}}}{\Delta s^2\, H^{n+1}_{\theta_{K-1}}} \qquad : m$$

$$B(N) = H^{n+1}_{\theta_N} + \frac{\lambda \Delta t\, K_{M_{Nm}}}{\Delta s^2\, H^{n+1}_{\theta_{Nm}}} \qquad : m$$

$$C(1{:}Nm) = -\frac{\lambda \Delta t\, K_{M_K}}{\Delta s^2\, H^{n+1}_{\theta_K}} \qquad : m$$

$$C(N) = 0$$

$$D(1) = H^n_{\theta_1} u^n_1 + \Delta t\, mn\, R_{u_1} + \frac{\Delta t(1-\lambda)}{\Delta s^2}\frac{K_{M_1}}{H^n_{\theta_1}}\left(u^n_2 - u^n_1\right) - \frac{\Delta t}{ds}\tau^x_b$$

$m\frac{m}{s} = \frac{m^2}{s}$ $\quad \$\ \frac{1}{m}\frac{1}{m}\frac{m^4}{s} = \frac{m^2}{s}$ $\quad \$\ \frac{m^2}{s}\frac{1}{m}\frac{m}{s} = \frac{m^2}{s}$ $\quad \$\ \frac{m^2}{s^2}$

$$D(2{:}Nm) = H^n_{\theta_K} u^n_K + \Delta t\, mn\, R_{u_K} + \frac{\Delta t(1-\lambda)}{\Delta s^2}\left[\frac{K_{M_K}}{H^n_{\theta_K}}\left(u^n_{K+1} - u^n_K\right) - \frac{K_{M_{K-1}}}{H^n_{\theta_{K-1}}}\left(u^n_K - u^n_{K-1}\right)\right]$$

$$D(N) = H^n_{\theta_N} u^n_N + \Delta t\, mn\, R_{u_N} - \frac{\Delta t(1-\lambda)}{\Delta s^2}\left[\frac{K_{M_{Nm}}}{H^n_{\theta_{Nm}}}\left(u^n_N - u^n_{Nm}\right)\right] + \frac{\Delta t}{ds}\tau^x_s$$