

so the tridiagonal set-up becomes:

$$- \left[\frac{\lambda \Delta t K_{Q_{k-1}}}{\Delta S^2 H_{\theta_{k-1}}^{n+1}} \right] q_{k-1}^{n+1} + \left[H_{\theta_k}^{n+1} + \frac{\lambda \Delta t K_{Q_k}}{\Delta S^2 H_{\theta_k}^{n+1}} + \frac{\lambda \Delta t K_{Q_{k-1}}}{\Delta S^2 H_{\theta_{k-1}}^{n+1}} \right] q_k^{n+1} - \left[\frac{\lambda \Delta t K_{Q_k}}{\Delta S^2 H_{\theta_k}^{n+1}} \right] q_{k+1}^{n+1} =$$

A stability function B is given by

$$\left\{ H_{\theta}^n q^n + \Delta t (P_b + P_e - \bar{\epsilon}_d) + \frac{\Delta t (1-\lambda)}{\Delta S^2} \left[\frac{K_{Q_k}}{H_{\theta_k}^n} (q_{k-1}^n - q_k^n) - \frac{K_{Q_{k-1}}}{H_{\theta_{k-1}}^n} (q_k^n - q_{k-1}^n) \right] \right\}$$

D

or

$$S_u (1 - \gamma A_1 A_2 S_u) - S_u (A_1 A_2 + \gamma A_1 A_2) =$$

$$A_1 (1 - \gamma C_1 - \frac{C_1 A_1}{A_2})$$

where

$$S_u = \min(0.025, S_u)$$

$$C_1 = \frac{H_{\theta}^n}{T_0} \Delta t = \frac{H_{\theta}^n}{T_0} \Delta t \quad N = \frac{H_{\theta}^n}{T_0} \Delta t$$

numerically it can be computed as

$$S_u = \frac{1 - \gamma A_1 A_2}{1 - (\gamma A_1 A_2 + A_1 A_2) S_u}$$

or

$$S_u = \frac{1 - \gamma A_1 A_2}{1 - \gamma A_1 A_2 - A_1 A_2 S_u}$$

where

$$S_u = \frac{1 - \gamma A_1 A_2}{1 - \gamma A_1 A_2 - A_1 A_2 S_u}$$

$$S_u = \frac{1 - \gamma A_1 A_2}{1 - \gamma A_1 A_2 - A_1 A_2 S_u}$$