

$$\begin{aligned} & \frac{d^2u}{dx^2} = 0 \\ (1) \quad & u(0) = 0 \\ & u(L) = 0 \\ & u(x) = 0 \\ & \frac{u_{i+1} - 2u_i + u_{i-1}}{h^2} = 0 or, u_{i+1} - 2u_i + u_{i-1} = 0 of form, Ax = b \end{aligned}$$

$$\begin{aligned} (2) \quad & x = \bar{A}^{-1}b \\ & \bar{A} = P_{x+}Q \\ & \bar{P} \\ & Q \\ & \bar{A} = \\ & L^+ \\ & D^+ \\ & U \end{aligned}$$

$$(3) \quad (D+L+U)x = b (D+L)x = -Ux + bx^{j+1} = (D+L)^{-1}(-U)x^j + (D+L)^{-1}b$$

$$\begin{aligned} & \bar{P} = \\ & (D+ \\ & L)^{-1}(-U) \\ & Q = \\ & (D+ \\ & L)^{-1} \\ & \bar{e}^j = \\ & u^e - \\ & u^j \\ & e^j \\ & y_{th}^j \\ & y^e = \\ & 0 \\ & e^j = \\ & -u^j \\ & u_i = sin\left(\frac{k\pi x_i}{L}\right) \end{aligned}$$

$$(4) \quad modes.epsFouriermodes$$

$$\begin{aligned} & \bar{e}^n = P^n e^0 \\ (5) \quad & \bar{P}^0 \\ & e^0 = \Sigma C_k v_k \end{aligned}$$

$$(6) \quad \begin{aligned} & C_k \\ & \bar{e}^k \\ & \bar{P} \\ & P^0 \\ & e^0 \\ & \bar{\lambda} \end{aligned}$$

$$\begin{aligned} & e^n = \Sigma \lambda_k^n C_k v_k \\ (7) \quad & |\bar{\lambda}_k| \\ & \bar{P} \\ & \bar{P} \\ & \lambda_k = 1 - sin^2\left(\frac{k\pi}{2N}\right) \quad k = 1, 2, ...N \end{aligned}$$

$$(8) \quad v_{s_k.epsEigenvalues\lambda}$$

$$\begin{aligned} & \bar{\lambda} \\ & \bar{e}^k \\ & \bar{P} \\ & \bar{P} \\ & \bar{\lambda} \\ & \bar{N} \\ & \bar{e}^k \end{aligned}$$