

Ges. $\underline{u}_h = [u_{ij}]_{ij=\overline{1,N}} \in \mathbb{R}^{n=N^2}$:

$$\frac{1}{h^2} (-u_{i-1,j} - u_{i+1,j} + 4u_{ij} - u_{i,j-1} - u_{i,j+1}) = f_{ij}$$

RB: $u_{0,j} = 0, u_{N+1,j} = 0, j = \overline{0,N+1}$ $i,j = \overline{1,N}$
 $u_{i,0} = 0, u_{i,N+1} = 0, i = \overline{0,N+1}$

$$K_n \cup_n = \underline{f}_n$$

mit geg. RS $\underline{f}_h = [f_{h1} \dots f_{hN} \mid f_{h2} \dots f_{h2} \mid \dots \mid f_{hN} \dots f_{hN}]^T \in \mathbb{Q}^q$

$$K_h = \frac{1}{h^2} \begin{bmatrix} 4 & -1 & & \\ -1 & 4 & -1 & \\ & -1 & 4 & -1 \\ & & -1 & 4 \end{bmatrix}$$

$$n = N_h^2 = O(h^{-2}) \quad , \quad BW = N = \sqrt{n} = O(h^{-1}) \quad (p=q=N)$$