

References:

[] Bank R.E., Rose D.J.: Some error estimates for the box method. *SIAM J. Num. Anal.*, 1987, v. 24, 777-787.

[] Hackbusch W.: On first (a) and second (b) order box schemes. *Computing*, 1989, v. 41, 277-296.

[] Knabner P., Angermann L.: *Numerik partieller Dgl.*, Springer, Berlin-Heidelberg-N.Y., 2000. Chap. 8

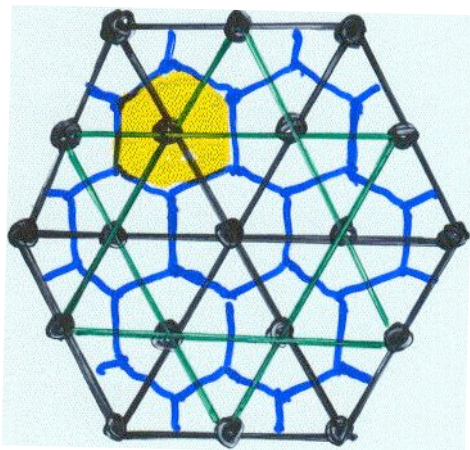
(a) $\|u_L - u_B\|_1 = O(h)$ (b) $\|u_L - u_B\|_1 = O(h^2)$

Remark 3.7:

In [] Liebau, F.: Analyse einer FVM mit quadratischen Ansatzfunktionen, *Niss.*, Kiel 1992, a higher order box method is proposed:

Idea: quadratic basis functions $p^{(i)}$:

$\rightarrow V_{oh} = \text{span}\{p^{(i)} : i \in \omega_h\}$ on the basis of $F(\Delta) = P_2(\Delta)$



$$\|u - u_B\|_{1,\Omega} \leq ch^2 \|u\|_{3,\Omega}$$

$\mathcal{T}_\Delta = \{\Delta_r : r \in \mathbb{R}_h\}$ quasi regular triangular mesh

$\mathcal{T}_x = \{\mathcal{K}(x) : x \in \bar{\omega}_h\}$: 1) \rightarrow

$x \in \bar{\omega}_h = \{0\}$

2) MD - or PD - secondary mesh built from the fine (green) mesh